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BOOKS

BY

EDWARD P. DAVIS, M.D.

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OBSTETRIC

AND

GYNECOLOGIC NURSING

BY

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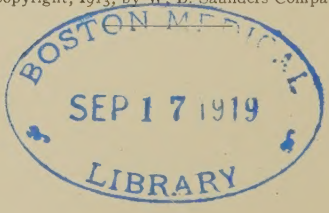

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PREFACE TO THE FOURTH EDITION.

THE fourth edition of this book has been enlarged and thoroughly revised. Appreciating the value of good nursing in hospital and private work, the author hopes that this book will be of interest and value to trained nurses. The writer is indebted to Miss Martin and to Miss Howe of the Jefferson Maternity for many suggestions of practical value. Acknowledgments are also made to Miss M. E. Smith, Superintendent of the University Hospital; Miss N. M. Rennyson, Chief Nurse of the Philadelphia Hospital; and Miss Walker, Superintendent of Nurses at the Pennsylvania Hospital for information concerning details of treatment.

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PART I.

OBSTETRIC NURSING.

INTRODUCTION.

OBSTETRIC nursing is that branch of the art of caring for the sick which includes the nursing of the mother during pregnancy, parturition, and the puerperal state, and also the care of her child.

It demands some knowledge of natural pregnancy and of the signs of accidents and diseases which may occur during pregnancy. It also requires knowledge and experience in the care of the patient during the labor and during her complete recovery, with the needs of her child. The obstetric nurse must also know how to help patient and doctor in the accidents and complications of labor, and has an important part to play in caring for mother and child in the diseases which occasionally attack them during the puerperal period. As wounds occur during labor, and as operations must often be performed during or immediately after labor, a thorough knowledge and drill in asepsis and antisepsis are absolutely indispensable.

The field of obstetric nursing is thus a wide one. Some of the most remarkable physiologic changes known in the human body accompany pregnancy and parturition; while few patients are so absolutely healthy

that pregnancy and childbirth proceed in a perfectly natural way.

The personal relations of the obstetric nurse with her patients are peculiarly interesting. The coming of the child is usually an occasion of joyful anticipation, while the accidents and diseases occurring at this time may become very rapidly serious and be followed by a tragic termination. No nurse who gives good and faithful service is more thoroughly appreciated by her patients and the physician in charge. The affection given so freely to the child is often extended to the nurse, and firm and lasting attachments of a most interesting nature often develop.

To nurses gifted with good health and strength, who have opportunities for proper training and experience, and who are naturally fond of young children, obstetric nursing offers an exceedingly interesting and very lucrative branch of medical work.

CHAPTER I.

DEFINITION OF PREGNANCY.—THE GROWTH OF THE OVUM.—THE FETUS.—THE ANATOMIC STUDY OF PREGNANCY.

Pregnancy.—By the term "pregnancy" is understood the presence of the impregnated ovum within the body of the mother. The ova are formed in the ovaries, from which they are discharged by the bursting of the sacs in which they are contained, and from which they pass through the oviducts, or Fallopian tubes, into the uterus, or womb. Impregnation may occur in the Fallopian tubes, and very rarely in the burst sac of the ovary. When the impregnated ovum has lodged in the womb and develops there to maturity, the pregnancy is said to be normal, intra-uterine, or entopic. When the impregnated ovum remains in the Fallopian tube or escapes thence into the abdomen or into the pelvis, the pregnancy is said to be abnormal, extra-uterine, or ectopic.

Growth of the Embryo.—When the impregnated ovum reaches the womb, it usually lodges in the upper portion of the uterus near the openings of the Fallopian tubes. It fastens itself to the lining membrane of the womb, and gradually forms membranes of its own which surround it. For the first few months of its development it is called an embryo. It resembles a small bladder, or cyst, covered on its outer surface with white shaggy projec-

tions which look like fringes of moss or like a soft and white chestnut burr (Fig. 1). These projections are upon the outer membrane covering the embryo, called the chorion, and are the tendrils by means of which the embryo clings to the wall of the womb. Within the chorion and next the embryo is a very thin and delicate membrane, called the amnion, which forms a fluid, called the amniotic fluid, in which the growing embryo moves during its development.

The characteristic form of the human being is seen in very early embryos. The limbs are soon developed; the

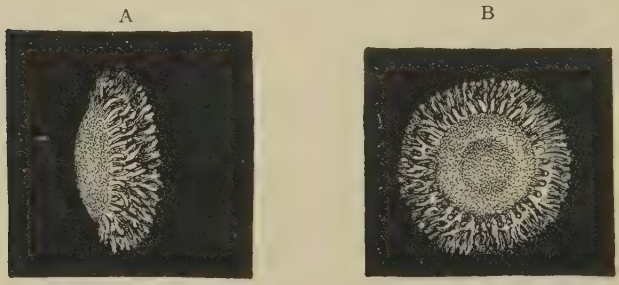


FIG. 1.—Human ovum of about twelve days (Reichert): A, side view; B, front view.

eyes appear in primitive form; the body is bent slightly forward, while the embryo moves in the amniotic liquid. It obtains its nourishment through a vesicle, or bladder, which contains rudimentary blood-vessels which afterward enter into the umbilical cord. During the first three months of pregnancy this description of the embryo would apply, and the chorion can usually be recognized by its pale and shaggy appearance, in cases in which the embryo is expelled, when the specimen is floated on cold water in a white vessel.

The Fetus.—At about the fourth month of gesta-

tion the after-birth, or placenta, begins to be formed, while the membranes rapidly grow larger to give greater space for the growing embryo. The name "fetus" is now applied to the young being, and the umbilical cord gradually develops, connecting the placenta to the umbilicus of the fetus. The form of the fetus is distinct and characteristic of the human being, the fingers and toes gradually become separated from each other, the eyes develop completely, and gradually the usual appearances of a newborn child are present in varying degree.

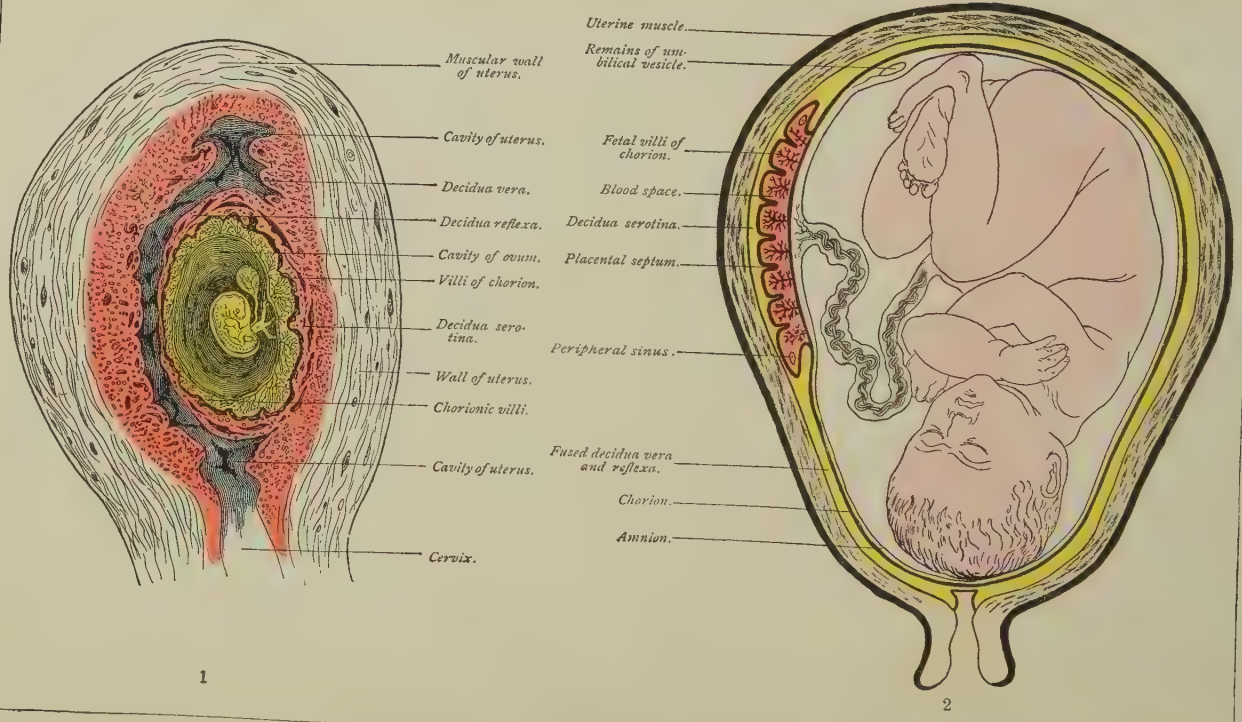
At twenty-six weeks of gestation the fetus has grown so large that it is possible for it to live outside the body of the mother. It is exceedingly unlikely, however, that such would be the case with most infants. At twenty-eight weeks, or seven months, children have often survived, and from this time on to the usual termination of pregnancy children are frequently born and live.

Position and Presentation.—During this time the child has assumed its position in the mother's womb, which in most cases is with the head lowermost, the back of the child turned toward the mother's left side, and the feet and knees upon her right side, just above the middle of the womb. The placenta grows in proportion to the weight and vigor of the child. The cord is sufficiently long to permit free movement on the part of the child, while the amniotic liquid provides a useful protective against injury and also a suitable medium in which fetal movements can occur. In some cases the head of the fetus is lowest and the back is turned to the mother's right side. In other cases the breech and thighs of the child are lowest, while the head is uppermost in the womb. Occasionally the child lies transversely in the uterus, with its head upon one side and its feet and limbs upon the other.

Full-term Pregnancy.—Pregnancy usually lasts in normal cases two hundred and eighty days. It cannot be said to be abnormal if it continues three hundred days, nor if it terminates at two hundred and seventy days. The average child at full term is twenty inches (fifty centimeters) long, weighs from six and one-half to seven and one-half pounds, is strong enough to cry vigorously and to suck the nipple of the mother, and is fully capable of living outside the mother's womb. Its placenta, or after-birth, weighs about a pound, and the umbilical cord is usually from fifteen to twenty-five inches in length. While the bones of the child are fairly developed, those of the skull are not tightly knit together, but can be moved at the edges, and in some instances can be made slightly to overlap. There are several membranous spaces along the central line of the fetal skull, the largest of which is called the anterior fontanel. This name was given because the beating of the blood in the brain can be seen at this point in the rise and fall of the membranes covering the brain. As this movement resembles that of a fountain, the space has been called a fontanel.

The Physiology of Pregnancy.—During pregnancy the healthy mother grows in all portions of the body. To feed herself and the child, the blood becomes abnormally rich, the muscle of the heart is larger and stronger than usual, the various organs of nutrition are increased in size and activity, and the skeleton becomes larger and heavier. The increase in blood is often evident in the darker color of the lips and other mucous membranes. In many patients the appetite is increased, the patient feels stronger and better than before, and is capable of considerable exertion. In healthy women the

PLATE I.



1. Semi-diagrammatic section of gravid uterus, showing contained ovum of about five weeks (modified from Allen Thomson).

2. Semi-diagrammatic section of uterus, showing ovum

excretions are increased and an additional quantity of oxygen is required to purify the blood. A vaginal discharge of whitish mucus is commonly observed during pregnancy and is a natural thing. The normal vaginal discharge in a healthy pregnant patient is capable of destroying bacteria, and is thus of value in protecting the mother. It should not be removed by douches in healthful cases, hence a nurse should not give a vaginal douche to a pregnant patient, not even if labor is beginning, without the distinct order of the physician in charge.

As pregnancy progresses, the size of the womb varies at different periods.

At four months the womb can be distinctly felt in the abdomen above the pubes, at five months it is midway between the pubes and the umbilicus, at six months the top of the womb is at the umbilicus, at seven months it is two fingers' breadth above, at eight months it is a hand's breadth above the umbilicus, and at nine months it is distending the tissues at the tip of the breast-bone or sternum (Plate 2).

After the ninth month, in patients who are pregnant for the first time, the child usually descends into the pelvic brim, and the uterus is lower down. In patients who have had several pregnancies the child remains above the pelvis until labor begins.

The child in the womb is usually situated with the head lowest at the brim of the mother's pelvis (Fig. 2). In most cases the back of the child is on the left side of the mother, and the heart-sounds of the child are heard on the mother's left side between the crest of the pelvis and the umbilicus. Occasionally the child has the head uppermost and the breech lowest in the womb, and, very

rarely, the child is turned transversely in the uterus. Occasionally the face instead of the vertex of the head is situated at the upper part of the pelvis. That part of the child which is lowest in the womb is said to present, and various situations of the child's body, with reference to the mother, are said to be its positions.

FIG. 2.—Adaptation between the uterus and the fetus at term in vertex presentation (American Text-Book of Obstetrics).

When more than one child is in the womb at the same time they fit into the uterus as best they can, usually the head of one being lowest and the head of the other being above.

The after-birth is usually attached to the posterior wall of the womb some distance above the opening at the mouth.

The child while within the uterus has lived through oxygen obtained from the mother's blood. The blood of the child passing through the umbilical cord into the placenta comes there so close to the blood of the mother that oxygen passes from the maternal into the fetal blood. Thus the child has had no need to breathe. Its lungs have required but very little blood. For this reason the circulation of blood in the unborn child differs from that in the child after birth. Before birth there is an opening in the partition between the two sides of the child's heart, and, as blood is not needed in large quantity in the lungs, it passes from the right side of the fetal heart into the left side, instead of going from the right side of the heart into the lungs. So soon as the child is born and the umbilical cord has been tied and cut, it ceases to

obtain oxygen from its mother. It begins to breathe. Its lungs unfold and admit air and the opening between the two sides of the heart closes. To help this the child should be laid upon the right side for the first day or so after birth. Several days are required to unfold fully the lungs and to seal perfectly the opening in the heart. If this does not completely shut, the blood of the child remains without its proper quantity of oxygen, the child is blue in the face, and is often called a "blue baby."

Not only does the child within the womb obtain oxygen from the blood of the mother, but some nutritious matter passes into the fetal blood, while the fetus discharges into the blood of the mother some of the waste matter from its own body. As the fetus during its development lives entirely upon the mother, it is evident that she requires abundant food of an easily digestible character; that she should have the greatest possible supply of fresh, pure air; and that she should discharge freely the waste from her own body through the kidneys, intestines, skin, lungs, and liver, because she is burdened with her own waste and that of the fetus as well.

The Anatomy of Pregnancy.—The womb, or uterus, in which the child is developed is a hollow muscular organ which increases in size with the growth of the child. Its muscular tissue is so interwoven that when it contracts it exerts great expulsive force. Although the womb before pregnancy is only two and a half to three inches in length, it becomes many times larger, extending with the child almost the entire length of the abdomen nearly to the diaphragm. As the womb grows it draws up somewhat the ovary and the Fallopian tube upon each side. As pregnancy proceeds the womb lies a little obliquely across the abdomen, its upper portion being a little to the right of the median line, and its lower

portion inclined a little to the left. It pushes the intestines to each side, often compressing them to such an extent that constipation results.

The Fallopian tubes are composed of muscular tissue, elastic tissue, and mucous membrane, resembling the uterus in structure. They are capable of slight contractions, and, should the impregnated ovum remain in the tube, it can develop to a certain point. The ovaries during pregnancy are usually quiescent, and menstruation does not, as a rule, continue during pregnancy.

The Birth-canal.—The Fallopian tubes, the uterus, the vagina, and the muscular floor of the pelvis comprise what is known as the birth-canal. This is contained in the pelvis, or bony basin. When the child has fully developed, labor must come on to secure the expulsion of the fetus from the mother's womb. The child is pressed out from the body of the mother by the contraction of the uterine muscle aided by the diaphragm and the abdominal muscles. The lower part of the womb, called the neck, or cervix, dilates or stretches, while the vagina and pelvic floor dilate and relax to allow the passage of the child. If the child be large, and if the tissues do not dilate readily, then lacerations, or tears, may result. If such tears be not closed by sutures, some portion of the birth-canal will sag downward or prolapse, and the supports of the womb being weakened, the uterus may assume abnormal positions, and the patient suffer as a consequence. The muscular and elastic tissues described form a continuous canal or muscular tube.

The Bony Pelvis.—The bony pelvis of the mother comprises the sacrum, which forms the posterior wall of the pelvis, and two large, irregularly shaped bones one upon each side, called the innominate bones. The two

side bones of the pelvis have different names in their different portions. Thus in front the two halves are termed the pubic bones, while at the lowest point near the rectum we have the ischia. The thigh-bones, or femora, fit into sockets at each side of the pelvis. These bones are bound together by ligaments, and the whole forms an irregularly shaped bony cavity which may undergo some change in form and contour during pregnancy and labor. The shape of the normal pelvis is caused by the healthy development of the mother, not only through inherited good health, but also through exercise. When, however, the mother has a disease of the skeleton like rickets, or when during early life she is prevented from walking and from exercising as she naturally would, deformity of the pelvis results. Bony tumors occasionally grow upon the walls of the pelvis and obstruct its cavity.

When in any way the pelvis becomes deformed, it is evident that its space may be so lessened that a healthy, full-term child cannot pass through. The mother cannot in such a case deliver herself, and the life of her child and often her own life must be rescued by an obstetric operation.

Medical Care during Pregnancy.—From what has been said regarding the growth of the child and the development of the pelvis, either natural or unnatural, it follows that each pregnant woman should early consult a physician. If anything unnatural be present, the physician can usually detect it during the pregnancy. Each patient should be seen as early as the third month of gestation. The physician will thoroughly examine the patient, and will detect complications which if neglected may jeopardize the lives of mother and child when the mother comes into labor. By palpation

and auscultation at the seventh month the physician can discover the period of pregnancy, the attitude and location of the fetus, and oftentimes of the placenta as well. By measuring the pelvis he will know whether it is normal or not; and if it be misshapen or too small, he may cause the pregnancy to end soon enough to obtain a living child before it becomes too large to pass readily through the pelvis. He can usually detect an unnatural position of the placenta; and, as some of these are very dangerous, he may interfere in time to save the lives of mother and child.

The Breasts.—During pregnancy the breasts, or mammary glands, develop to provide nourishment for the child. They become larger, firmer, oftentimes sensitive to pressure, while coloring-matter is deposited around the nipples, making this portion of the breasts very much darker. If the nipples are not deformed, they grow and project as pregnancy advances. In many cases, however, they are congenitally deformed, are badly developed, or have been stunted in their growth by the pressure of corsets or tight clothing. In some cases cracks or fissures in the mucous membrane covering the nipple develop; and unless careful attention be given to this condition serious trouble for mother and child may result. If these cases be detected in time, under appropriate treatment they are cured, and the patient escapes a complication trying for both mother and child.

From this sketch of the growth of the embryo and of the birth-canal during pregnancy we may appreciate how great are the changes which pregnancy causes in the body of the mother, and how necessary it is that she receive proper care during this time, that her own health and that of the child be successfully continued during this period.

CHAPTER II.

THE NURSING OF NORMAL PREGNANCY.

It is true that women who remain in fairly good health during pregnancy seldom have the services of a nurse. There are, however, many things regarding which the pregnant woman often asks advice, and some respects in which she profits by special care and attention.

When the fact of pregnancy has become known to the mother, she naturally desires so to live as to secure not only her own health, but also the health and development of her child. There are many instances which show how profoundly the mother's condition during pregnancy affects fetal development. Women who are partially starved, or who habitually take poisonous drugs like alcohol, are badly nourished themselves, and bring forth children deficient in strength and development. Famine, war, and pestilence show their effects upon children born during these periods. Prolonged sorrow and great mental depression during pregnancy seriously affect the child. On the other hand, an abundance of properly selected food, an abundance of fresh air, gentle exercise, and, above all, a tranquil and happy nervous state, with freedom from shock and disturbance, tend to produce the best development of the child. To obtain this mode of life is very difficult, and the mother who does so must give up some of the occupations and pleasures which she would otherwise enjoy. She must,

for example, avoid crowded rooms, overheated buildings, excitement, indigestible food, late hours, and fatigue, such as women often experience in prolonged shopping or at social functions. Many women are glad to do this in view of what they hope to accomplish by it, while others are too selfish to change their mode of life.

Those who struggle with care and poverty cannot obtain the best mode of life, and they and their offspring suffer as a consequence. Their overtaxed condition produces a frail and nervous state in the child.

Diet.—The diet of normal pregnancy should be based primarily upon three kinds of simple food, namely, milk, fruit, and bread. The quantity of meat taken should be distinctly curtailed, and meat should not be used more often than once daily. Fish or eggs in season may be taken in place of meat. All fruits and vegetables in season may be used, fruits being especially valuable because of their laxative properties and of their stimulating action upon digestion. Rich foods, fried dishes, pastry, large quantities of meat, sweets, indigestible salads, nuts, pickles, cheese, candies, lobster and crabs, large quantities of tea and coffee, or alcohol should be distinctly avoided. It is in the rarest cases only that the pregnant woman requires alcohol. Some patients do not enjoy milk unless it is diluted with effervescing waters, or unless it is prepared by rennet or is made into milk puddings, custards, koumiss, or is taken with gruels. Each pregnant patient needs from one to two quarts of water in twenty-four hours. The greater part of this should be taken between meals, especially upon retiring and on rising in the morning.

Our attention has recently been called to the value of buttermilk as an article of diet in many cases. It is of especial value for pregnant women when it can be prop-

erly prepared. Buttermilk as ordinarily purchased has often but little nutritious value, is frequently dirty, and may occasion severe indigestion. A reliable buttermilk can only be obtained from clean milk, churned carefully, put in sealed bottles, and delivered to the consumer at a relatively low temperature. It is difficult to obtain such buttermilk, as much of it is made by churning by those who do not handle milk carefully.

A more efficient way of obtaining good buttermilk consists in buying the best quality of clean, whole milk, and souring it with tablets containing reliable cultures of lactic acid bacillus. When the activity of this bacillus is not allowed to go too far, buttermilk so made is agreeable to the taste and very digestible and nutritious. If there is any doubt concerning the quality of the milk from which it is made, such milk may first be pasteurized by heating to 157° F. for six minutes, and then treated with the lactic acid bacillus. In all well-established training-schools the preparation of lactic acid buttermilk is taught and practised.

If the first specimen prepared should occasion indigestion, it is well to stop the action of the bacillus as soon as the milk is slightly sour to the taste. As whole milk is used, containing all the cream, buttermilk so prepared is very nutritious.

Clothing.—So soon as the first weeks of pregnancy are past the patient will naturally desire to be freed from any pressure by her clothing upon the abdomen. This can be accomplished by the use of a suitable waist, to which much of the underclothing can be buttoned at its lower border, and which obtains its support from the shoulders of the patient. Such a waist can be purchased at the shops or may be made to order if desired. The Equipoise waist, so called, is a good one of this kind

(Figs. 3–5). In cold or cool weather thin woolen or silk and wool, in combination suit, should be worn next the skin over the entire body. Circular garters should be replaced by long side garters. Shoes and slippers should fit easily, and wraps and all clothing should be loose and made with the greatest regard to comfort.

FIG. 3.—The "Equipoise Waist."

Many so-called maternity corsets are in the market and sold extensively to pregnant patients. None of these is suitable, as it makes undue compression, and can only sustain the patient's clothing by dragging downward upon the corsets. The ordinary long straight-front corset gives many patients relief after operation, but the conditions are entirely different in pregnancy. Here the patient has a tumor which is allowed to grow, and whose

growth must not be impeded. In order that the uterus may develop naturally and the child grow healthfully, pressure upon the abdomen must be avoided in all healthy women.

When the patient has borne several children, and the abdominal wall is relaxed, the uterus may fall forward, occasioning inconvenience, and sometimes interfering

FIG. 4.—Patient wearing bandage supporting abdomen and breasts during pregnancy.

FIG. 5.—Equipoise waist worn during pregnancy.

with the birth of the child. In such cases, during the latter months of pregnancy, a bandage may be fitted, making gentle but broad pressure from below upward, and sustaining the uterus in its natural position.

Exercise.—If a pregnant patient be suitably dressed she will be able to exercise, especially as her pregnancy proceeds. Walking at a comfortable pace over a smooth path is usually the most enjoyable exercise, although

driving in an easy carriage over a smooth road is also pleasurable. During the first few months of pregnancy railway travel should be avoided if possible. After this, a railway journey in a comfortable car may often be undertaken without discomfort. Some patients are much nauseated by the motion of a train.

To be avoided are reaching high above the head, going up and down long flights of steep stairs, taking a very high step, lifting or straining, riding, bicycling, and using a sewing-machine driven by the feet.

Motoring.—If a motor car is used, a smoothly running machine should be chosen. In most large cars the patient will feel least jarring on the front seat. *If possible*, the car should not run at high speed, and the patient should be suitably dressed to avoid chill. Motoring at a rapid rate is excessively fatiguing, and pregnant patients should take especial care to avoid exhaustion from this source. A patient may become easily chilled in rapid riding, and this should be avoided. Extensive observation in America and Europe shows that motoring is a frequent cause of miscarriage. The motor produces more jarring than any other carefully made vehicle. The Victoria was especially designed for use by patients in this condition, and is the best carriage for the purpose.

Fresh Air.—It is very interesting to note in some patients their desire for an abundant supply of fresh air. Many are so urgent for it as to make the rooms in which they are uncomfortable for other persons. This desire is most natural, and should always receive attention. All rooms occupied by pregnant patients should be most thoroughly aired. This is especially true of sleeping-rooms. The best ventilator is an open fireplace, and a window containing a board which raises the sash from the bottom, leaving an air-space at the junction

of the upper and lower sash, furnishes excellent ventilation.

Quiet.—The need of quiet for pregnant patients is very great. The cares and worry of daily life often become almost unbearable to persons in this condition. It must be true that constant disturbance and worry have their influence upon the unborn child; hence if it can possibly be obtained, the patient should have the comfort of undisturbed repose.

Baths and Bathing.—It is especially important that the skin of the mother acts freely during this period. She should bathe as often as she finds it comfortable to do so. The warm tub-bath at night and a moderately cool sponge-bath in the morning are the best combination for this condition. The warm bath is an excellent means of securing repose and aids sleep, while the cool sponge-bath is invigorating and prevents the patient from taking cold. Neither hot nor very cold baths should be taken.

During pregnancy the patient's skin is often unusually sensitive, and none but the mildest toilet soaps and other toilet preparations should be used. Soaps made from vegetable oils only are to be chosen.

Where excessive perspiration is annoying, bathing with the best quality of alcohol and water, equal parts, and the use of the best quality of talcum powder, often gives great comfort.

Many pregnant patients are greatly annoyed by discoloration of the skin, which usually appears upon the abdomen, thighs, about the nipples, and sometimes on the face. No local application can cure this condition, and it is one of the inevitable inconveniences of pregnancy. It usually disappears entirely after the birth of the child.

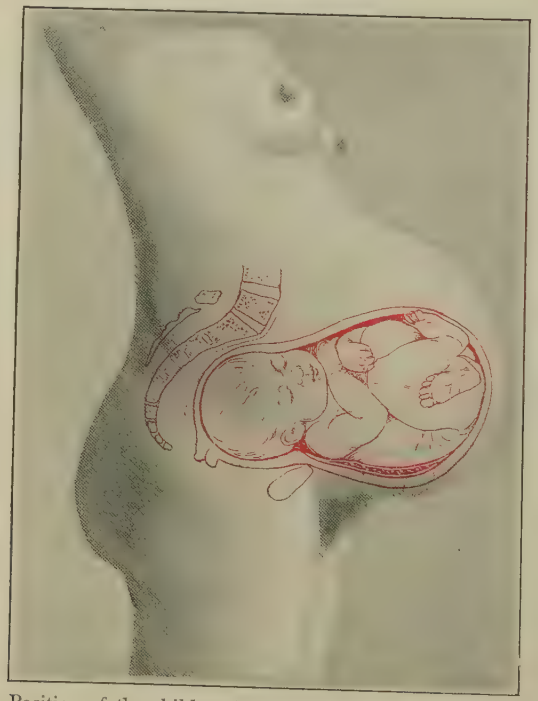
Growth of the Uterus.—As pregnancy continues

certain phenomena are observed which will attract the attention of the patient, and will often lead her to question a nurse regarding the subject. The abdomen increases steadily in size in normal pregnancy, and at four months a tumor can be appreciated just above the pubic bone. If the patient's abdominal wall is very thick, it may be very difficult to find this tumor without deep pressure; but if she be a thin person, the tumor will be found with comparative ease. At this time the uterus begins to rise out of the pelvis, and many pressure-symptoms, such as irritability of the bowel and bladder, and nausea, are often considerably relieved. When six months have elapsed the top of the womb is as high as the umbilicus. When seven months, it is two fingers' breadth above the umbilicus, and at eight months a hand's breadth. When nine full months have been completed in the first pregnancy the womb has risen so far that it puts the tissues attached to the tip of the breast-bone, or sternum, on the stretch. The patient may often be very uncomfortable from the sensation of weight and interference with breathing, while the size of the abdomen is very evidently greatly increased.

Descent of the Child.—From the end of nine months until the time of labor the child gradually descends into the mother's pelvis. If it be the first pregnancy, the child descends lower than it will in subsequent pregnancies, because the uterus of the mother, being strong and elastic, forces the child lower down than in other cases. In the first pregnancy the mother feels a distinct sense of relief from abdominal pressure, and notices that the abdomen grows considerably smaller. Her clothing becomes looser at the waist; she can move about with more comfort and breathe with more freedom. This is not a sign that the fetus is not doing well, but

PLATE 2.

The non-gravid womb and the same at eight months, with varying heights of the fundus marked in weeks.



Position of the child and the uterus in a case of pendulous abdomen.

simply that pregnancy is drawing near to its close. There may be increased discomfort from the pressure of the child's head on the neck of the bladder, and sometimes upon the bowel also, but the difference in the abdomen is marked.

In women who have had several children the child does not descend so low at this time. The head of the child lodges against the side of the pelvis, the womb is not so strong and elastic, and hence the patient's size is less changed. In women who have borne a considerable number of children the womb is often relaxed and somewhat flabby, and may be broad and hemispheric in shape. Symptoms of pressure upon the bladder and rectum are not so frequent in women who have borne a number of children as in those pregnant for the first time.

Uterine Contractions.—The uterus contracts and relaxes during the entire period of pregnancy. This causes the sensation of pain, and the patient may often complain bitterly and imagine that labor has begun. These contractions and relaxations are very important in fitting the child into the mother's pelvis. They naturally become more pronounced as pregnancy draws near its close, until they finally terminate in the actual beginning of labor. If the mother be reclining and the hand be laid upon the surface of the uterus, the womb can often be felt to contract and then to relax. The meaning of these pains should be known to a mother if they are severe; and if it is not time for the birth of the child she should lie down, taking a short period of perfect rest, when the pains will usually subside.

Fetal Movements.—The movements of the fetus within the womb are always a source of interest and sometimes of alarm to the mother. They are usually felt about the fourth month. The sensation is described

as that of the fluttering of a bird held within a closed hand. In young patients pregnant for the first time the first movements of the fetus are sometimes very terrifying. When their meaning is understood, they occasion no disquietude. It is very seldom that a precise date can be fixed for detecting fetal movements in the first pregnancy. They are so faint and slight that considerable experience is required actually to detect them. When women have had several children they can often state with positiveness that fetal movements were present at or very near a certain date. Many women are accustomed to use this date in computing the probable time of confinement, reckoning it to be at the fourth month of pregnancy. If the fetus moves actively, it excites contraction of the uterine muscle, and hence brings about intermittent pains. In some cases movements are so active as to interfere seriously with the mother's sleep, and in other cases the movements give rise to such vigorous contractions of the womb that the patient suffers considerably. There is no way of controlling the movements of the fetus except by having the mother avoid active, violent exercise. This will usually bring about a period of considerable repose.

Patients are sometimes greatly disturbed because fetal movements grow weak or sometimes apparently cease. This may occur shortly before the beginning of labor. If the mother's general health has been good, this does not inevitably mean that the child has perished or has become greatly weakened. If the patient be examined by her physician, he will usually detect heart sounds, which is the best proof that the child is living.

The Breasts.—Pregnancy is almost invariably characterized by abnormal sensations in the breasts, which in some patients are felt very early. They are described as

tingling, pricking, or shooting pains, with great sensitiveness, and sometimes with itching or abnormal sensations about the nipple. The breasts are usually sensitive from the pressure of clothing, and the patient realizes that the breasts are increasing rapidly in size. In ordinary cases little is required in the care of the breasts, if the nipples be sound and healthy. They should be examined early in pregnancy to ascertain whether the nipples can be drawn out by the thumb and finger or by the child in nursing, so that they can readily be grasped. The nipples should always be examined for cracks and fissures, and especially for evidences of soreness or sensitiveness or wounding. Dried secretions in small crusts are often found upon the nipples, and should be removed by the application of oil, followed by gentle washing with Castile soap and warm water.

FIG. 6.—Mammary gland: 1, milk-ducts; 2, glandular portion (Playfair).

The breasts are composed of a number of divisions, each containing secreting cells, emptying into the nipple by small tubes or ducts. The different portions of a breast resemble bunches of grapes; and if several bunches be taken and held together by their stems, a simple but fairly accurate representation

of the breast may be obtained. The stems would represent the tubes, or ducts, which empty at the nipple, and the branches would represent the different divisions of the breasts. The individual grapes upon the bunches would represent small collections of secreting cells (Fig. 6). The nipple is covered with an epithelial membrane, composed of small cells laid upon a supporting membrane, as a pavement is laid upon the bed of a street. If these epithelial cells be in good condition, the nipple will be healthy and will not crack nor fissure. If, however, these cells be not in good condition, or if they be deficient in development, when the child nurses the act of sucking may strip off the protecting cells and leave a raw surface upon the nipple, through which infection may enter the lymph-channels or the blood. Hence it is very important that during pregnancy the epithelial cells of the nipple should be sound and healthy, and should be formed in abundant quantities.

To bring about this result the nipple should first be cleansed in a very gentle but thorough manner, to remove dried secretions and any foreign matter which may have stuck to the nipple from the patient's clothing. Then a mild and simple ointment should be employed, which will keep the nipple soft and further the growth of cells, and thus put it in healthy condition for the child's nursing.

Patients are sometimes advised to use applications for hardening the nipples. This should not be done without the advice of a physician, for in the majority of cases such preparations make the nipples more easily crack, and do harm rather than good.

The physician should be requested to examine the nipples in all cases, and should he detect any unusual

condition he will order the appropriate method of treatment.

Morning-sickness.—Among the early phenomena of pregnancy many patients experience what is called morning-sickness, or the nausea of pregnancy. This is usually experienced so soon as the patient awakes, or in some cases so soon as she rises from bed. If the stomach be promptly emptied, this often ends the nausea; and if the patient takes a little liquid food or a cup of tea or coffee, or even of hot water, she goes through the remainder of the day in comfort. Other patients are nauseated for a longer part of the day, and in some cases the condition becomes a very serious one. All pregnant patients do not have morning-sickness, but many do; and it is so common among patients who employ nurses that nurses are very likely to hear of it, and should understand its significance.

Constipation.—As the womb increases in size before it rises out of the pelvis into the abdomen, it may cause pressure upon the bowel and interfere with their movement. This is especially true if the womb be tipped backward, when it lies almost against the bowel. As the uterus grows in size constipation increases, and many experience very great difficulty in securing movements of the bowels during pregnancy. In ordinary cases the patient's bowels can be kept in fairly good condition by properly selected diet. This should comprise grains so prepared as to leave a portion of the husk or coarser part of the grain, which will act as a stimulus to the intestine. Oatmeal, cracked wheat, fine hominy, breakfast-foods of various kinds, and in some cases rice, are all useful for this purpose. Graham-flour in the shape of bread or biscuit, and rye flour usually

mixed with Graham-flour or with white flour, are also useful. A liberal supply of fruit, of which the best are apples and oranges, should be afforded. The patient's appetite often craves large quantities of fruit, and this appetite should be indulged to the fullest extent if digestion remains good. We have known a patient to consume what seemed to be very large quantities of oranges and apples during pregnancy, remaining in excellent health. Grapes, rejecting the seeds and skin, are especially useful. Strawberries do not agree with all pregnant patients, and some cannot take bananas. With some, uncooked fruit does not agree, although they do perfectly well when fruit is stewed or baked. Many prefer apples in the form of puddings, and those who cannot use raw fruits may substitute dried peaches or fruits put up in glass. Most canned or preserved fruits, however, contain too much sugar to make them suitable articles for diet in pregnancy. In avoiding the constipation of pregnancy a liberal quantity of water must be employed, and this should be taken not only at meal-times, but also on rising and before retiring, and between meals. Any sort of water which the patient prefers may be freely used. Aerated waters are often very acceptable, especially to patients who are suffering from abnormal secretion in the stomach or mouth. Apollinaris, Vichy, and soda water, are those most often taken. The free use of fruits, vegetables, or suitably prepared grains, and the taking of plenty of water, with exercise and bathing, will prevent serious constipation during pregnancy in the majority of cases. It is far better to be careful in this regard than constantly to employ drugs in the treatment of this condition.

Very rarely, pregnant patients are affected with diar-

rhea, which usually results from irritation of the bowel produced by pressure of the growing uterus. It seldom becomes severe, and is usually readily controlled by simple changes in the diet. The use of milk or of liquids for a few days is usually all that is necessary.

Nurses should advise patients to obtain from the attending physician a diet list to be used during pregnancy. Many patients require a change in diet while in this condition, and the diet must often be varied at different

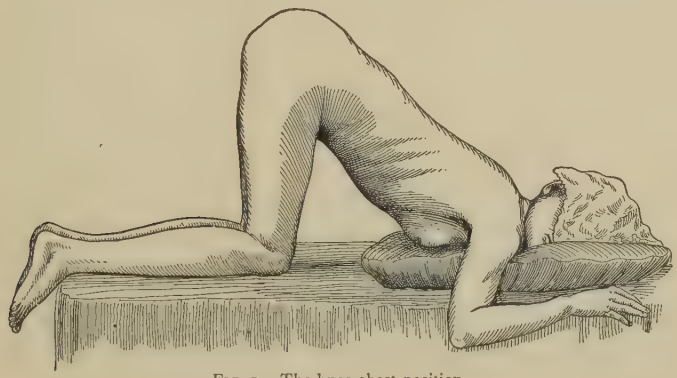


FIG. 7.—The knee-chest position.

periods of gestation. The selection of a proper diet is of great importance, and the patient should receive accurate directions for this purpose.

Irritability of the Bladder.—Disturbances in the functions of the bladder are often caused in pregnancy by the pressure of the growing uterus. This is most likely to occur at two periods: First, when the uterus is not entirely out of the pelvic cavity, and when it is directed forward and downward against the neck of the bladder or tipped backward; and second, at the latter portion of pregnancy, when the head of the child is

entering the pelvic brim. The frequent desire for micturition and the voiding of small quantities of urine are the result of this condition. In the early stages of pregnancy it is often relieved by having the patient assume the knee-chest posture (Fig. 7) for a short time night and morning. When it occurs just before labor it can only be relieved by the removal of the fetus from the uterus. The use of a catheter will give temporary benefit, but will not result in permanent cure.

Faintness.—Pregnant patients are often greatly annoyed by sensations of fainting, or syncope. In some cases this results from weakness, while in others it is entirely a nervous phenomenon, and is especially liable to result from an overheated room, or some temporary excitement or a slight fright. Pregnant patients should avoid close rooms and excitement. When faintness occurs the patient should lie down, have the clothing loosened, and remain perfectly quiet for a short time. The attack will speedily pass, and usually occasions no serious complication.

Swelling of the Legs.—Swelling of the legs and feet is very common during the latter months of pregnancy. If it is worst at evening, if the patient has little or no headache, if she does not feel dull or depressed, or profoundly melancholic, it is not a serious symptom. If, however, it is attended with very scanty secretion of urine, with violent headache, throbbing in the temples, impaired vision, and great disturbance of mind, it is then a serious symptom, and should be at once reported to the physician in charge. Pregnant patients should wear loose and easily fitting slippers and stockings, all constriction about the limbs and waist should be avoided, and if the patient be easily fatigued she should take frequent

intervals of rest in the recumbent posture. By this means swelling of the feet and limbs can be largely avoided. When such a condition is attended by obstinate itching, frequent bathing with cold water and in some cases bran foot-baths are especially efficacious.

Care of the Skin.—During pregnancy the skin of the abdomen often becomes greatly stretched, and pinkish-white streaks may appear, which may give the patient considerable anxiety. Patients sometimes ask whether the application of oil to the abdomen will not prevent this stretching, and leave the skin of the abdomen in better condition after pregnancy is over.

There is no objection to the use of a mild ointment, such as cold cream or the best quality of olive oil, very gently applied, with light rubbing. During the latter months of gestation this may lessen the formation of the stripes just described, and be of use in bringing about a natural condition of the skin after the child is born.

Where the skin is excessively dry and harsh, warm tub-baths with bran are often useful. Usually daily bathing with moderate rubbing of the skin is sufficient.

CHAPTER III.

NURSING IN THE COMPLICATIONS OF PREGNANCY.

Fecal Impaction.—Cases sometimes arise in early pregnancy in which the uterus becomes displaced, and by its pressure against the rectum produces chronic retention of feces. In these cases the patient has considerable suffering, not only from constipation, but also from the pain and pressure-symptoms which the position of the uterus and the presence of hardened feces create. In these cases it is necessary to empty the intestine not only by purgatives and laxatives, but also by mechanical means.

The physician in charge will usually prescribe such medicines as will render the feces thoroughly soft. The patient's diet should be suitable for the occasion, there being not much meat, but a considerable quantity of vegetables and fruit. A free supply of water is also necessary for these cases.

The mechanical relief of these patients is obtained by injections adapted to softening the feces and to remove them in a partially liquid state. It is occasionally necessary to extract with the fingers portions of hardened matter which otherwise could not be brought away.

In using injections for these patients care must be taken that the injections should not be too hot nor too cold, and that they be administered as gently as possible, as

undue violence might result in the production of abortion. The simplest sort of injection is very dilute warm Castile soapsuds. This is useful for cleansing purposes, but is not well adapted to soften hard fecal matter. At least one quart would be necessary, and this should be given at a temperature of 100° F., by means of a fountain-syringe, the patient lying upon her left side, and having the hips higher than the rest of her body. Where it is desired to introduce the fluid as high as possible in the bowel, it is well to employ a large-sized soft catheter, passing as far into the bowel as possible. The patient should be encouraged to retain the fluid as long as possible, and when the inclination for movement occurs the injection may be repeated, when the bowel will usually be emptied without much difficulty.

Preparations of oil are especially valuable in cases of obstinate constipation. It is not, however, easy to convey the oil without mixing it with some suitable vehicle. Either castor oil or olive oil may be employed, and the following combination has been found most useful:

Castor oil or olive oil, 1 ounce;
Castile soapsuds (at a temperature of 100° F.), 1 quart.
Mix together as thoroughly as possible; add spirits of turpentine, 1 dram, thoroughly beaten up with the yolk of 1 raw egg.

This combination makes an unirritating and exceedingly efficient injection. If this does not run readily through a fountain-syringe, a smoothly working piston-syringe should be employed. Care should be taken to give the injection very gently, using as little force as possible and disturbing the womb as little as possible.

Saline injections are sometimes given in combination with glycerin. The following is a useful formula:

Magnesium sulphate,	2 ounces;
Glycerin,	2 "
Spirits of turpentine,	½ ounce;
Warm water,	1 quart.

Unless the case is a very obstinate one, however, injections containing oil should be preferred to this, lest the energetic action of this combination should excite uterine contractions.

When it is necessary to soften the hardened fecal matter ox-gall is often dissolved and injected, and allowed to remain for several hours before the bowels are moved. The following combination has been found useful:

Powdered ox-gall,	½ ounce;
Olive oil,	1 "
Water (temperature 105° F.),	1 pint.

Thoroughly mix. A piece of Castile soap is then stirred about in this mixture, to make a light lather. The whole when thoroughly mixed is at a temperature of 100° F., which is suitable for the purpose. It should be injected as high into the bowel as possible through a large-sized soft catheter or flexible tube, the finger being inserted into the bowel before the introduction of the tube. If the patient's pelvis be raised considerably, it will assist in obtaining a good result. If care be used, the patient should suffer no discomfort, and should be able to retain the injection for several hours. In using this combination some prefer to mix the oil and oxgall separately, then to make one pint of castile soap-suds, hot and stirred to a lather, this to be poured into the oil and oxgall, and the whole thoroughly mixed. It is thought that the oxgall dissolves better in this way.

In giving injections to remove hardened feces, when it is desirable to carry the material injected high into the bowel, the knee-chest posture is often most advantageous. The patient may assume this either before the injection is given or just after. A few moments of this posture aids very greatly in promoting the passage of an enema high into the intestines. When it is inconvenient or uncomfortable for the patient to assume this posture she may lie upon her back with the hips considerably raised by folded blankets or pillows, or she may lie upon her left side with the hips raised. In either case the result is good.

Considerable time is necessary for the thorough emptying of the intestine, because fecal matter is not readily softened. In some cases the softening material may be given at bedtime, and an injection for cleansing the bowel administered on the following morning. In other cases several injections during the day are necessary for this purpose. It has been said that great care must be taken in giving these injections that uterine contractions are not excited and that no undue force is used. Tubes employed for this purpose should be cleansed by boiling in soapsuds or by rinsing in hot soda solution.

In addition to injections for emptying the bowel, suppositories are often useful. Such are made of gluten or of glycerin, and may be inserted two hours before the administration of an injection.

Pernicious Nausea.—Pernicious nausea of pregnancy is a condition in which the patient is profoundly depressed and nauseated during her waking hours. In many cases food is rejected so soon as swallowed, and beverages are also rejected by some patients. The matter vomited consists at first of the food swallowed, then of a thin and glairy mucus, and finally, in fatal cases, of a dark coffee-ground-looking material. Patients usually

lose rapidly in weight, become profoundly prostrated, and in some instances die of exhaustion.

In nursing these patients it is of great importance that a cheerful and encouraging mental influence be exercised. The words "nausea" and "vomiting" should not be mentioned to the patient. She should not be given a basin or a towel in which to vomit, as many nervous patients are made sick by such a suggestion. These cases are put to bed by the physician in attendance, and every effort made to support the strength of the patient, hoping that the nausea may cease. External warmth is applied if necessary by hot bottles and suitable covers. All depressing and disturbing influences are removed, and the patient's room should be bright and cheerful, and her attention should be diverted if possible from herself in any agreeable manner. She should have a soap-and-water sponge-bath once daily, and once daily a light massage, or an alcohol-and-water sponge, or massage accompanied by the inunction of olive oil. The mouth and teeth should receive attention, as patients are sometimes greatly annoyed by the formation of sordes and a very foul condition of the tongue. The mouth may be cleansed with boric-acid solution, with dilute thymol, with lemon-juice, glycerin and water, or with ice-water and a little alcohol. The patient should be catheterized if necessary, although she can usually leave her bed to use a commode.

The direct treatment of these cases consists in the administration of drugs ordered by the physician, and given by the mouth, by hypodermic injection, or by rectal injection. The nurse will receive precise orders from the doctor as to the times and modes of medication.

Other methods of treatment sometimes employed are the washing out of the stomach and the use of electricity. To assist the physician in washing out the stomach, the

nurse must have ready several pitchers containing water at a temperature of from 100° to 105° F., a slop-jar, sodium bicarbonate, and sodium chlorid, a rubber stomach-tube, a funnel, a piece of rubber sheeting, glycerin or olive oil for lubricating the tube, and an abundant supply of clean towels. If the tube be cooled by ice before passing, it is less likely to cause nausea. The physician will give precise directions as to the nature of the fluid to be employed in washing out the stomach. He will introduce the stomach-tube, and the nurse will pour through the funnel the fluid which she has prepared at his request. It is sometimes necessary to keep the patient's teeth apart by folding a soft napkin into a wedge or cushion which is placed between the molar teeth. When this is in position the nurse may be asked to hold it in place. The effort is sometimes made after washing out the stomach to pour through the tube broth or soup, in the hope that it may be retained.

To use electricity in these cases, the nurse should be competent to take care of the battery employed, unless the physician brings it with him for each application. The nurse will require a basin of warm water, absorbent cotton for covering the electrodes, and in some cases a little salt in addition. One electrode is usually placed over the epigastrium, or pit of the stomach, while the other is placed at the back of the neck. The duration of the application and the strength of the current must be regulated by the physician in attendance.

It is sometimes deemed advisable in these cases to try the effect of hypodermoclysis or intravenous transfusion of saline fluid. Here the nurse must remember that needles or cannulas employed should be boiled before they are used, and that the skin should be made aseptic before either method of procedure is carried out. The

fluid to be introduced must have been sterilized by boiling, and the physician in charge must give precise directions as to the amount of sodium chlorid or sodium bicarbonate which he desires the nurse to prepare. After the introduction of fluid in this way the point of puncture or incision into the vein must be protected by a light sterile dressing until it has perfectly healed.

In these cases physicians often desire to introduce salt solution into the bowel to cleanse the intestine, or for purposes of absorption. Irrigation of the intestine must be done carefully and very gently, as otherwise it may cause the patient suffering, and even do harm. The patient should be placed on her left side, with the hips raised. A medium-sized best quality rectal tube, which has been sterilized, thoroughly warmed, and lubricated with sterile oil or glycerin, should be inserted as far as possible, using very gentle pressure only. The patient should be instructed to breathe very gently with the mouth open during its insertion. Salt solution at a temperature not less than 100° F. should then be allowed to run into the tube from a bag not higher than 4 feet above the patient's body. The solution should be allowed to run until the patient experiences a sensation of fulness, and the fluid shows a tendency to return. For purposes of irrigation, the fluid should be allowed to run back through the tube, and if the tube becomes stopped with feces more fluid should be injected. If the patient desires, the tube should be removed and the fluid and feces should be discharged.

For absorption, from half a pint to one pint should be used, and when this has run into the bowel the tube should be very gently removed, the patient urged not to strain, and a pad of sterile gauze be held over the bowel

until the fluid ceases to come away. Unless definitely ordered by the physician, all fluid injected into the bowel should be warm, but nothing but warm water or salt solution should be used without the physician's definite orders.

Where the patient is being fed by rectal injections, the bowel must be thoroughly cleansed by irrigation at least once in twenty-four hours.

The *preparation of food* for these patients requires the most painstaking attention. It is seldom possible to use solids, and barley-water, beef-juice, chicken-, mutton-, and beef-broths must be employed instead. Milk cannot be used unless pancreatized or peptonized, and in many cases in combination with barley-water or lime-water.

Barley-water.—Put one tablespoonful of washed pearl barley in a saucepan with one pint of water. Boil in double boiler slowly for four hours. Strain through fine wire sieve. The following directions for preparing barley-water and other broths are original, we believe, with Starr:

Barley-water.—Put two teaspoonfuls of washed pearl barley in a saucepan with a pint of water; boil slowly down to two-thirds of a pint; strain.

Raw Beef-juice.—Take one pound of sirloin of beef, warm it in a broiler before a quick fire, cut into cubes of about one-quarter of an inch, place in a lemon-squeezer or a meat-press and forcibly express the juice; remove the fat that rises to the surface after cooling. *Never actually cook the meat.*

Chicken-broth.—A small chicken or half of a large fowl, thoroughly cleaned and with all the skin and fat removed, is to be chopped, bones and all, into small pieces; put them, with salt, into a saucepan, and add a quart of boiling water; cover closely and simmer over a

slow fire for two hours; after removing, allow to stand, still covered, for an hour; then strain through a sieve.

Mutton-broth.—Add one pound of loin of mutton to three pints of water; boil gently until very tender, adding a little salt; strain into a basin, and when cold, skim off fat. Warm when serving.

Beef-broth.—Mince one pound of lean beef, put it with its juice into an earthen vessel containing a pint of water at 85° F., and let it stand for one hour; strain through stout muslin, squeezing all juice from the meat; place this liquid on the fire, and while stirring briskly slowly heat just to the boiling-point; then remove at once and season with salt.

Orange and Lemon Albumen, Whey, and Buttermilk.—One of the most acceptable and easily digestible forms of nourishment is what is known as orange or lemon albumen. This is prepared by shaking thoroughly the white of one raw, fresh egg with eight ounces of cool water, and adding to it the juice of one lemon or the juice of one ripe orange. From four to eight ounces of this may be given at one time, and patients will often retain and relish this when other food will not be absorbed. The white of egg is one of the simplest forms of protein matter, and the juice of the lemon or orange is very efficient in quenching thirst and stimulating secretion.

Whey is often acceptable in these cases, and is best prepared by a reliable liquid rennet. Rennet tablets usually produce a thicker whey, which is often not so acceptable to the patient.

Buttermilk prepared from the best quality of whole milk by reliable tablets is often used in these cases.

It is well to feed by the stomach at the hours of dinner and luncheon, continuing rectal feeding during the night

and morning. As soon as the patient can take an ounce of broth she will usually enjoy a little stale bread soaked in the broth, or livers of one or two raw oysters, or part of an egg beaten up with milk or brandy. The patient should not be asked whether she desires food, nor should she know what is to be given her; nor should food be kept where she can see or smell it.

In cases in which the patient retains very little or no food when given by the stomach, feeding by the bowel must be employed. The success of this method of treatment depends not only upon the selection of the proper materials and their careful preparation, but also upon the care with which the injections are given and the especial attention to cleanliness which these cases demand. The most successful results are obtained with materials which a nurse can prepare. There are many preparations in market especially recommended for this purpose, but they are not so uniformly successful. Among those which are often employed are peptonoids, panopeptone, somatose, various beef-juices, and other similar preparations. The following formulæ have been found most useful:[1]

1. Beef-tea, 3 ounces;
   Yolk of 1 raw egg;
   Brandy, ½ ounce;
   Liquor pancreaticus, 2 drams.

2. 1 whole raw egg;
   Table-salt, 15 grains;
   Peptonized milk, 3 ounces;
   Brandy, ½ ounce;

[1] The writer is indebted for these formulæ to Miss M. E. Smith.

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3. Beef-tea, 2 ounces;
   Brandy, ½ ounce;
   Cream, ½ "

4. Beef-tea, 2 ounces;
   1 whole raw egg.

5. Beef-juice, 1 ounce.

6. Beef-essence, 6 ounces.

7. Whites of 2 raw eggs;
   Peptonized milk, 2 ounces;
   2 eggs.

To give nutrient injections successfully, the material employed must be at a temperature of 100° F., and should be introduced by a piston-syringe, which works perfectly smoothly, through a soft catheter carried very gently as far into the bowel as possible. A funnel connected by rubber tubing with the catheter may be used. The patient should lie upon her left side with the hips raised. She should be urged not to strain nor bear down, but to endeavor to retain the material injected. Nutrient injections are given as a rule at intervals varying from four to eight hours. Unless the tubes employed are kept surgically clean and the rectum is washed out daily with sterile water, inflammation of the bowel may result, when the patient will fail to retain the injections. It is best to cleanse the bowel each morning by a copious but gentle enema of very mild soapsuds, followed by boiled water. Tubes used for rectal feeding should be boiled once or twice daily, and when not in use should be kept in a solution of boric acid. To lubricate these tubes, sterile glycerin or sterile olive oil should be used.

It is sometimes thought desirable to add medicines to

rectal injections. This is done under the precise directions of the physician in charge, those substances being selected which are most easily dissolved and least likely to irritate the mucous membrane of the intestine. In addition to feeding and medication by rectal injections, nutritious material and medicine are sometimes placed in large gelatin capsules, which are introduced within the bowel and allowed to dissolve, when the food or medicine is absorbed.

A small amount of nutritious matter can be introduced within the body by inunction in these cases. To accomplish this, the skin must be kept in good condition by sponging with warm soap and water, and by frequent light massage. The best time for inunctions is after the soap-and-water sponge-bath. The materials employed may be sterile olive oil, or olive oil (two parts) and alcohol (one part), or sterile cocoa-butter. From one to four drams of fat may be rubbed into the body by gentle but patient manipulation. The patient's strength is undoubtedly increased by such treatment.

Cases of pernicious nausea sometimes develop bed-sores very rapidly. To avoid this the patient should be turned frequently upon the side, the skin should be kept in good condition by frequent bathing, and when indications of a bed-sore appear pressure should be removed by the application of rings of adhesive plaster or compresses of powdered baked starch, or other methods applicable to prolonged and wasting disease.

In some of these cases the cause of the pernicious nausea is found in some abnormal condition of the womb. This may be remedied by local treatment, and the nurse in charge of such a case should be prepared to assist the physician in such treatment. She will require

an abundant supply of hot water, antiseptics, surgical cotton or prepared wool, and in many cases antiseptic gauze; in some cases applications may be made of iodine or some other medicinal substances. To assist the physician in the treatment of such a case the nurse should understand the various postures used for such treatment and the various methods employed. In severe cases it is especially valuable to the attending physician to have complete notes kept by the nurse, giving an accurate summary of food and stimulants retained during the twenty-four hours. Unless the patient improves, it may be necessary to terminate pregnancy by an operation to save the mother's life.

Toxemia of Pregnancy.—During pregnancy the quantity of waste material formed in the body of the mother is considerably increased, and in addition she must excrete or discharge the waste material formed in the body of the fetus. If this process of elimination is not complete, the patient will suffer from the poisonous effects of the retained material. The symptoms of such poisoning are headache felt severely above the eyes, dulness and lassitude; constipation; failure to perspire; and a scanty secretion of urine, usually accompanied by a furred and coated tongue. In some patients severe neuralgia accompanies the headache. If this condition be allowed to go unrelieved, it may terminate in eclampsia, which may prove fatal.

A patient with the symptoms just described should consult a physician at once. The treatment employed in this condition calls for active movement of the bowels, and the duties of the nurse would lie in administering medicines ordered and in giving purgative enemas. The combination of magnesium sulphate, glycerin, tur-

pentine, and soapsuds, which has been given, would be found especially useful in such cases. The physician may prescribe sedative medicines for the cure of the headache, although these are of little importance in the cure of the case. The patient's diet is usually restricted as nearly as possible to milk; and as this often proves tedious, the nurse would be called upon to prepare various milk-foods which might prove palatable. Such are junket (made by curdling milk with rennet ferment), koumiss, light milk-puddings, custard, peptonized and pancreatized milk, buttermilk, and in some cases a small quantity of cottage-cheese is allowed. In suitable cases ice-cream may be made for the patient, using a minimum of sugar and egg, and employing the greatest possible quantity of cream and milk. Well-made toast thoroughly softened is usually allowed. This is often served with milk or cream. Ripe fruit, raw or cooked without sugar, and the most digestible green vegetables, are frequently ordered.

With these patients the action of the skin must be thoroughly roused. The patient may be given a hot tub-bath, and while in the bath may be asked to drink several glasses of water as hot as it can be borne. This will usually cause free perspiration. In other cases the patient is given a hot pack or a steam or vapor bath. If a nurse be put in charge of such a patient, she would be expected to measure accurately the amount of urine passed, and to send specimens frequently for examination. She would also be expected to follow strictly the diet prescribed, and to carry out carefully the physician's directions in the matter of bathing.

Water is usually given very freely to such patients.

The quantity is often definitely prescribed, and the nurse must see to it that the directions are carried out.

Care must be taken that the patient has at all times an abundance of fresh air, avoiding chill and damp.

The Use of the Cabinet or Pack.—One of the most efficient and acceptable means of thoroughly rousing the action of the skin is the electric cabinet, which is in use in all well-appointed hospitals.

This is a box containing electric lights, the cover of which fits about the patient's neck. The patient, devoid of clothing, sits in the box upon a chair, covered with clean linen or Turkish toweling, and a thick Turkish towel or bath-mat is placed under the feet. The neck is surrounded at the lid of the box by a bath-towel. A towel wrung out of cold water is placed over the forehead. By turning on additional lights the temperature can be gradually raised to 120°, 130°, 140°, or 160° F., or even higher if ordered. The patient's body sweats freely, while the patient does not feel oppressed by breathing hot air. The room in which the cabinet is placed should be thoroughly warmed, so that the patient does not become chilled when the cabinet is opened. From five to fifteen minutes in the cabinet will secure vigorous action of the skin. The patient should drink water freely, slightly cool or hot, as the physician may order. The heat may be gradually lessened by gradually turning out the lights. When the sweat is ended, the patient should be gently but thoroughly rubbed with warm water and alcohol, immediately wrapped in clean, warm, dry sheets or light blankets, as the physician may order, and put to bed in a moderately warm and well-ventilated room. If care be taken in gradually lessening the heat and in

having the room well ventilated, patients rarely complain of fainting or difficulty in breathing.

To give a hot pack the bed to be used should be covered over its mattress with a rubber blanket, and upon this should be placed a blanket wrung out of water as hot as the elbow of the nurse can readily stand. The patient, divested of her clothing, should lie upon the blanket, which is wrapped about her. The lower extremities should each be wrapped in a blanket separately. An additional blanket wrung out of hot water should be placed above the first, and over this a rubber blanket. The patient's head should be moderately raised and an ice-bag placed at the vertex of the head, or a thick cloth wrung out of cool water before the pack is given.

If the pack is successful the patient will begin to sweat in a few moments, and the first signs of perspiration will be seen about the nostrils or lips. The patient may remain in the pack from half an hour to one hour, as it will gradually cool. The temperature of the room should not be less than 75° F., so that the patient will not become chilled when the pack is over.

When it is desired to take the patient out of the pack, she should, if possible, be placed upon another bed, upon a warm, dry blanket, and a second dry blanket placed over her, when she should be gently, but thoroughly, rubbed dry with a warm towel. If but one bed is available the patient may be brought to the edge of the bed and the blankets used in the pack rolled together and removed, and a warm, dry blanket placed beneath her. After the pack the patient should lie between blankets.

Accidents sometimes happen in giving hot packs where the patients are unconscious or very ill, and do not feel the sensation of burning. This usually occurs when hot-

water bottles are placed around the patient outside the hot, moist blankets with which the patient is covered. A hot-water bottle may press the moist, hot blanket so firmly against the patient as to burn at that point, and if the patient be unconscious a severe burn may result. This can only be avoided by skill and experience in giving the pack. If sweating can be produced without the use of hot-water bags in addition to the hot blankets it is safer not to use them.

Symptoms of Improvement.—When these patients grow better headache becomes less, the patient is less drowsy and oppressed, the skin is moist and sweats easily, the secretion of urine is increased, the bowels move thoroughly, and the patient craves food. The change in the mental condition of these patients which accompanies improvement is often very striking and most gratifying.

When the patient does not improve, sweating is but scanty, but little urine is secreted, the bowels do not move thoroughly, headache continues, and the patient is restless or stuporous or gradually becomes unconscious.

Desire for Rest.—When patients are threatened with toxemia of pregnancy they often feel too weak for exertion. In this condition they are often unjustly blamed by their relatives or friends, who do not understand the danger, and think that the patient should make an effort. When these cases come under the observation of nurses they should appreciate how ill the patient is, and that her desire for rest is a symptom that should lead to the prompt employment of appropriate treatment.

CHAPTER IV.

LABOR, DESCRIPTION OF AND PREPARATIONS FOR.

Labor is that process by which the child is removed from the body of the mother. In natural, spontaneous labor the mother expels the child by the contractions of the uterus and abdominal muscles. When these forces fail the child may be removed from the body of the mother by various surgical procedures.

Labor also includes the removal not only of the child, but its appendages as well. These are the placenta, the membranes, the umbilical cord, and the amniotic liquid. If any one or part of these is retained, the labor is incomplete.

This process must be a gradual one for the safety of mother and child, and may be conveniently divided into periods or stages. The first stage of labor extends from the first regular contractions of the uterus to the time when the neck and mouth of the womb dilate or open. The second stage of labor is occupied with the expulsion of the fetus; and the third stage comprises the removal or expulsion of the fetal appendages.

The accurate recognition of labor is an important matter which comes within the province of the nurse. If the patient be wrongly supposed to be in labor, the attending physician may be called unnecessarily, the

patient unduly excited and alarmed, and much valuable time wasted. Upon the other hand, if the beginning of labor is not recognized, the patient may be suddenly taken with violent expulsive pains, and the child may be delivered before assistance can reach her. The recognition of labor can best be accomplished by considering carefully the various phenomena which make up this process.

Pains.—The symptom of labor which is noticeable to the patient is pain in the lower portion of the body. In the first stage of labor this pain begins in the back in the lower third of the spinal region, and extends gradually around the body to the front, or pubic region. Together with these there are slight cutting sensations deep in the pelvic region, and a discharge, varying in quantity, of mucus slightly tinged with blood. Irritation of the bladder and rectum is also present, the patient desiring to empty the bladder very frequently. In some cases nausea and vomiting occur. The pains of labor result from uterine contractions; and although these contractions have been going on at intervals during pregnancy, they have been irregular, and would cease if the patient remained quiet. Labor-pains, however, come at fairly regular intervals, and tend steadily to increase in vigor and in the severity of the suffering which accompanies them.

Other causes than labor may produce pain in the abdomen. For example, intestinal colic is a frequent source of abdominal pain. This may follow the eating of indigestible food, the drinking of very cold fluids, or the formation of gas in the bowel through nervous apprehension; and in some rare cases the pain may be the

result of neuralgia or rheumatism in the muscles of the abdomen.

Recognition of Labor.—To tell that a patient is in labor or is not in labor, the nurse should first wash her hands thoroughly with warm water and soap, and then should place the patient upon a comfortable bed or couch, upon her back with the thighs drawn up. If labor be beginning, the womb can be felt by the hand laid upon it to contract and then to relax at fairly regular intervals. If labor is not beginning, however, uterine contractions will not be especially noticeable.

The nurse can judge fairly well of the course and progress of labor by the regularity and vigor of the uterine contractions. She should in all cases take the precaution to ascertain from the physician when he wishes to be summoned. If this be understood, the nurse will send for the doctor upon plain and positive indications, and thus will save an unnecessary expenditure of his time. It is often difficult to persuade patients that the first pains of labor are not of the greatest importance. It is especially hard to persuade them to have patience during this part of labor, because they cannot recognize that progress is being made. In sending for the physician, the nurse should tell how long the pains have been going on, at what intervals, and how strong they are. By sending as much information as possible with the message the doctor can often plan his course in such a way as to give every attention, and yet not interfere unduly with his work.

First Stage.—The duration of the first stage of labor varies greatly. In young patients pregnant for the first time the first stage of labor may last from twelve to more than twenty hours. The patient will not be in

active pain all this time, and may be able to eat and sleep quite comfortably.

The first stage of labor comes more under the care of the nurse than any other portion of labor. There is little or nothing which the physician can do for his patient, and hence it is better that he should not be in her presence or near at hand at this time. Many patients ask constantly for sedative and anodyne drugs to relieve their suffering. If these are given, the course of labor is delayed, and hence the patient's suffering is prolonged. Unless it is necessary to bring on sleep, careful physicians rarely give sedative drugs during the first stage of labor. Hence the patient relies very largely upon the encouragement and care which the nurse gives her during this prolonged and tedious time.

Second Stage.—The bursting of the waters, or rupture of the membranes, marks the end of the first and the beginning of the second stage of labor. This often occurs suddenly, and the quantity of fluid discharged may vary from a few ounces to one or even several quarts. In young patients considerable alarm may be felt when the membranes rupture, through lack of knowledge and experience of what is happening. In some cases it is impossible to tell when the membranes rupture; the discharge of fluid is so slight as to be unnoticed. In other cases the membranes are so tough and resisting that they do not break naturally, but are ruptured artificially by the physician. When rupture occurs labor usually proceeds much more actively. The pains become more severe, uterine contractions are stronger, the patient is roused to exert herself by straining, pressing, and bearing down to assist in the birth, and the child usually moves steadily downward through the body of the mother. The second,

or expulsive, stage of labor varies in duration from a few moments to several hours. On the average it is about two hours in length. During this time the patient has strong contractions of the womb, coming at regular intervals and followed by periods of absolute quiet and relaxation. During the uterine contractions the face becomes flushed, the heart beats very strongly, the patient often perspires, and there is abundant evidence that great muscular exertion is taking place. In the intervals between the contractions of the womb and abdominal muscles the patient will often rest quietly and sometimes doze. This is Nature's protection against exhaustion; and when the patient does not rest between the pains she is evidently in danger of becoming thoroughly tired out. As the child descends through the pelvis, when uterine contractions occur the womb rises in the abdomen, projecting downward and forward, and becoming exceedingly hard and resisting. When the child reaches the pelvic floor and the presenting part comes against the muscular and elastic tissues and the mucous membrane of this region, the pressure of the child against the nerves of this portion of the body greatly increases the patient's suffering, and brings about more violent contractions of the womb; the patient complains of a tearing, pressing, or rending sensation; the perineum bulges; the mucous membrane about the anus becomes dark reddish and sometimes projects, and if the bowel has not been thoroughly emptied before labor fecal matter is often pressed out. As birth proceeds the scalp of the child becomes visible in the vulva, the pains seem to increase in violence, the parts become greatly distended, and finally the head of the child is born, the face being directed downward and backward and the

occiput, or vertex, being directed upward and forward (Fig. 8).

When the head has been born there comes a cessation of a very few minutes in the labor; and then the patient has further uterine contractions, and the shoulders and body of the child are born. The arms are usually folded across the chest and the forearms flexed upon the arms.

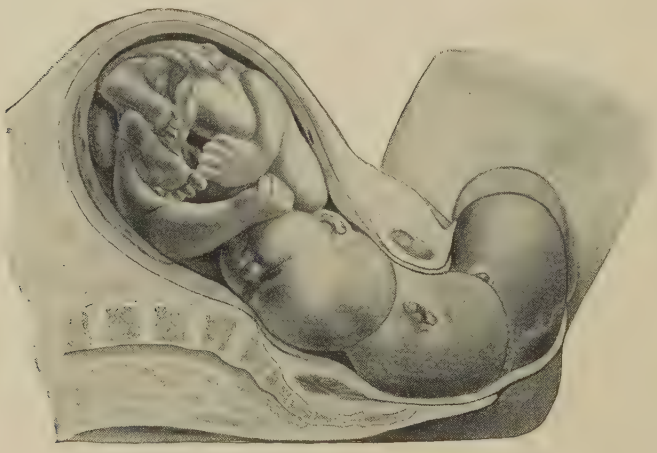


FIG. 8.—Birth of the head.

Should this not be the case, but should the arms drop downward away from the child's chest, the point of the elbow may tear the mother considerably as it emerges.

There usually occurs with the child the passage of a part of the amniotic liquid which has been kept in the womb by the pressure of the child's body. The child usually turns upon its side in the mother's bed, and very often begins to cry so soon as born. It is still connected with the body of the mother by the umbilical cord, which continues to pulsate, and through which blood passes

from the mother to the child. This pulsation gradually ceases in from five to ten or fifteen minutes; and when the pulsation ceases, if the child does well, it cries or moves more vigorously. Very little discharge of blood follows the birth of the child if the labor is natural. The mother lies still, being exhausted with the efforts of parturition, and the uterus remains large, although well contracted, because it still contains the after-birth, or placenta.

Third Stage.—When the cord has ceased to pulsate, it is tied by two ligatures and cut between them, and the child is taken away. A pause of from fifteen minutes to half an hour occurs after the expulsion of the child, during which the mother lies perfectly quiet. She sometimes experiences a slight shiver or chilliness, which is not a septic rigor, but which is caused by the cessation of the great muscular effort which she has made. Finally there occurs the return of uterine contractions, and a second, smaller labor takes place. The pains come on again at regular intervals and are not very severe, the uterus contracts, there is a very slight flow of blood, and then the edge of the placenta appears in the vulva. If the uterus contracts well, the placenta is expelled entirely, the membranes coming after it in a rope or strand. There is but little bleeding, the womb remains well contracted, and the labor has ended naturally.

Preparations for Labor.—From our study of labor we see that it is a process which exposes the mother to wounds and lacerations in the genital tract, and that the separation of the placenta leaves a wound as large as a small saucer within the womb. Our knowledge of wounds and their healing teaches us that the parturient patient is exposed to the dangers of wound infection, or, in other words, to puerperal sepsis. We also know that if the

uterus does not contract the patient will suffer from bleeding, and that if she be extensively torn in child-birth, bleeding may occur from ruptured vessels. If we are to care properly for the patient, she must have the same treatment which patients receive upon whom surgical operations are performed. There must be aseptic or antiseptic dressings to protect this patient from wound infection. Hemorrhage must be prevented or checked, and lacerations in the birth-canal will require closure by suture. This is especially true in cases in which labor has terminated by the use of instruments, when the birth becomes a distinctly surgical operation. In addition to proper dressings the nurse must be prepared to take antiseptic precautions regarding her hands, her clothing, and any articles which she may use about the patient. There must also be at hand stimulants and anesthetics for a surgical procedure. While in natural birth assistants are not often required, in operative cases the physician needs an assistant to give ether, just as he would for a surgical procedure. Nurses who prepare themselves for surgical work do not expect to attend cases of infectious disease, and if they have a septic case are exceedingly careful to disinfect themselves before going to another operation. So the obstetric nurse must avoid infectious diseases, and thoroughly disinfect herself before going from a septic to a non-septic confinement.

In addition to preparations for the care of the mother, the child must be considered. Precautions must be taken to avoid infection in the child's body at those places at which it is most apt to occur. Its clothing must be provided, and it often requires a considerable degree of warmth.

Dressings.—In providing proper dressings for a patient

to be confined, the question of expense and of the work of the nurse engaged must be considered. Suitable dressings may be procued in one of two ways: Antiseptic gauze can be obtained at drug-stores and instrument-shops, from which dressings can be made. Such gauze, however, costs more than simpler dressings. If the patient desires to avoid this expense, and if she will compensate the nurse, the nurse can prepare dressings which are aseptic or can be made antiseptic at small cost. The choice of the method of preparing dressings should be left to the patient, and must be determined somewhat by the circumstances of the case.

A cheap and comfortable dressing is made from absorbent cotton and the cheaper quality of cheesecloth. Two thicknesses of the cotton as rolled are taken in a piece seven inches long and five inches wide. Each roll furnishes cotton sufficient for thirty-eight dressings. This piece of cotton is enclosed in one-quarter of a yard of cheesecloth, so folded as to be eighteen inches long and five inches wide. A roll of cotton can be purchased for thirty-five cents, and cheesecloth costs five cents per yard. The number of dressings required will vary somewhat with the nature of the patient and the character of the case. As a rule, dressings must be worn for two weeks. Making a very liberal estimate of the number which may be required, the cost of the simple dressings described will approximate two dollars. The preparation of these dressings is the work of the nurse who is to attend the patient in confinement. Dressings may be either sterilized, or may be sterilized and made antiseptic as well. In the former instance the dressings are made with clean hands, and the edges of the cheesecloth are run together with a simple stitch. It may not be convenient to make the

entire quantity required at first, but sufficient may be prepared for the first week of the lying-in period. Three or four dozen are an ample supply for this purpose. These should be put into a clean old pillow-case or wrapped in an old sheet, and the bundle put into an oven and the dressings baked for as long a time as convenient. They should be left in the sheet or pillow-case, wrapped in a large clean sheet of wrapping-paper, labelled, and put away until required.

When it is desired to use cheap antiseptic dressings, they may be prepared in the manner described, the napkins dipped in a solution of mercuric chlorid (1 : 2000), then dried, and baked in addition. Cheesecloth as purchased from the shops often contains stiffening material, which is designed to make it lie smoothly in the piece. This must be removed before the cheesecloth is ready for use as a surgical dressing. A ready method of accomplishing this consists in boiling the fabric in water to which sodium bicarbonate has been added, rinsing it in clean boiled water, and either drying it, or soaking it in bichlorid solution, after which it can be dried and cut into convenient lengths.

In addition to material for vulvar dressings, bandages will be required for the abdomen and also for the breasts (Fig. 9). Unbleached muslin is usually selected for this purpose. Sufficient should be purchased to make from half a dozen to one dozen abdominal binders, and from half a dozen to one dozen bandages for use in dressing the breasts. The abdominal binder should be forty-seven inches long, of double thickness, hemmed at the edges, and fifteen inches wide. The breast bandage should be on the average forty inches long and ten inches or more in width. In choosing rubber sheeting to protect the

mattress, double rubber sheeting should be obtained if possible. Unbleached muslin costs about ten cents per yard, while rubber sheeting costs about one dollar per

FIG. 9.—Breast bandage and abdominal binder.

yard. Two pieces, one yard square, should be obtained if the patient can afford them. Leggings are used in some maternities during operation, and laced and but-

toned breast and abdominal bandages are employed by some (Fig. 10).

When a patient wishes to economize, clean old linen

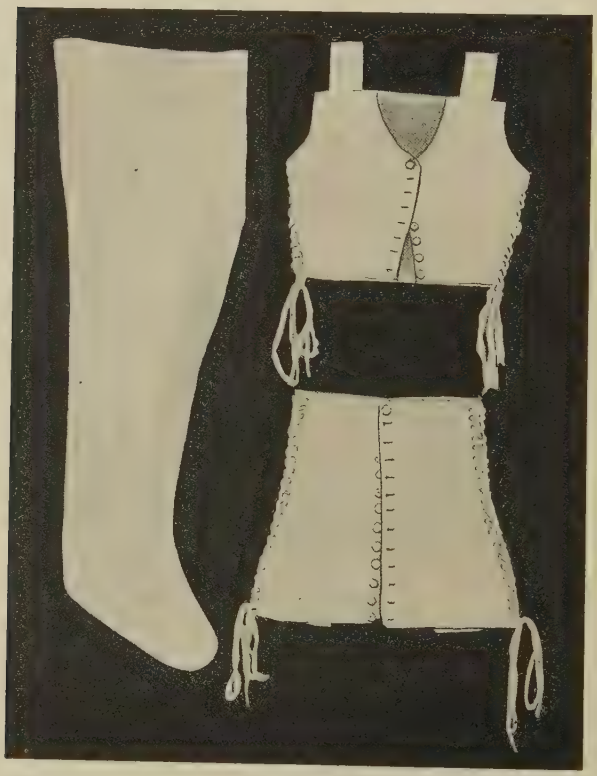


FIG. 10.—Leggings for use during operations; laced and buttoned bandages for breasts and abdomen.

may be employed to good advantage. This is soft, and may be sterilized by boiling or baking, and made antiseptic by soaking in antiseptic solutions. With cotton-batting it can be used in place of cheesecloth. To give

firmness to vaginal dressings, a little oakum may be placed in the center, inclosed in the cotton.

Medicines.—In addition to dressings, some medicines are necessary, and may be obtained upon the physician's order from the druggist. Such are: Fluid extract of ergot, one ounce; brandy, two ounces; sterile boric-acid solution, one pint; lysol, three ounces; fifty tablets of mercuric chlorid, of which one to the pint equals 1 : 1000.

The following lists are those which we are accustomed to give to patients. One of these calling for antiseptics and other drugs, and prepared gauze, should be sent to a druggist, who will put up the articles in one large package, to remain unopened until they are needed.

The other list comprises articles which the nurse should prepare at the patient's home.

List of Articles to be Furnished by a Druggist for Confinement Cases.—Fifty tablets bichlorid of mercury, one to the pint equals 1 : 1000; lysol, six ounces; bichlorid gauze, five yards in glass jar; borated cotton, one large box; sterile saturated solution boracic acid, one pint; one large new fountain-syringe; double rubber sheeting, two yards; one medium-sized, soft catheter; one glass catheter; two stiff nail-brushes, with wooden backs; one new medicine-dropper; Squibb's fluid extract of ergot, one ounce; Squibb's ether for anesthesia, two half pounds; brandy, two ounces; tincture green soap, eight ounces; one box containing tubes of aseptic ergot, Parke, Davis & Co's; twenty tablets, each containing sulphate of strychnia, 1–40 gr.

List of Articles for Confinement to be Prepared by the Nurse.—Three good-sized basins; three good-sized pitchers; six sterile sheets; two dozen sterile towels;

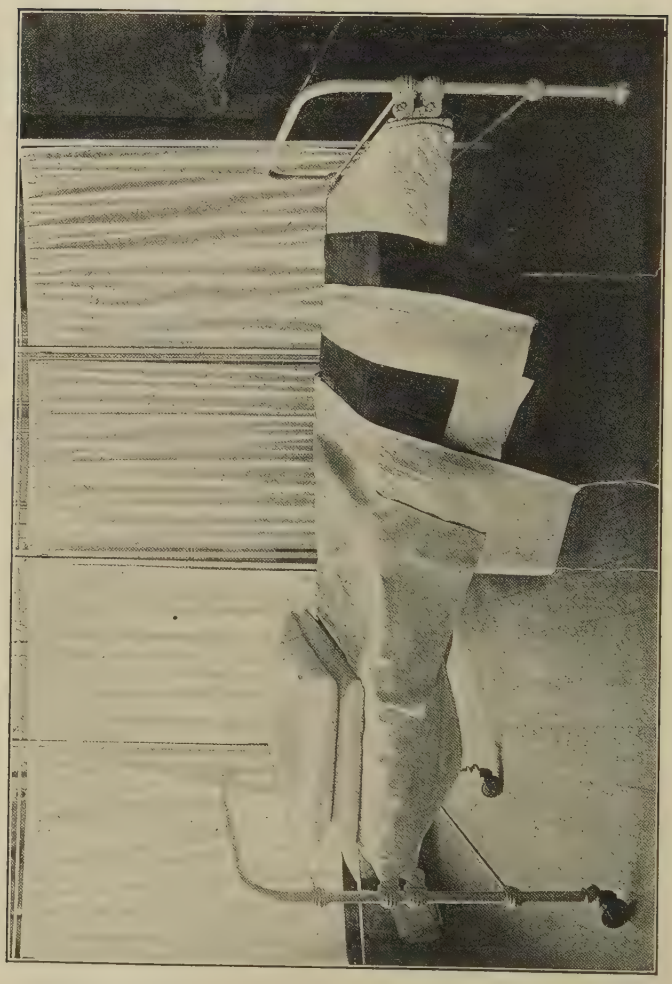


FIG. 11.—Delivery bed, with bedding turned back to show the various layers.

one dozen breast binders; one dozen abdominal binders; large package of dressings for external use; sterile cotton sponges.

Room for Confinement.—Whenever possible the nurse should give to her patient assistance in selecting and suitably arranging a room for confinement. This should be in as quiet a part of the house as possible, where sunshine and air gain free access and, for the convenience of the nurse, on the same floor with a bath-room. The room should not have in it a stationary washstand nor any connection with pipes leading to a sewer. If possible, it should not have a register from a furnace opening into it. It is of great advantage if such a room have an open fireplace, in which a fire can be kept burning during cold weather. It is very convenient to have adjoining this room one or two smaller rooms for the use of the nurse and the child.

The furniture should be as simple as possible, and it will be of great assistance to the nurse if a high and narrow bed can be used. A bed which is otherwise suitable, but too low, may be raised by placing a stout block of wood from eight inches to one foot high, under each leg. The mattress should be made of the best quality of hair, and while agreeably soft it should be firm. Old hangings should be taken away from such a room and as little drapery as possible employed. If there is any record of illness in this room, it should be thoroughly cleaned and aired; and if there has been a case of infectious disease the room should be thoroughly fumigated as well. Carpet is unnecessary on the floor of the room unless the weather be very cold, and a few rugs are all that is needed. Any expensive or highly finished furniture should be removed, as it may become soiled or injured from antiseptics or other material employed about the patient.

Bed.—For the bed, there should be in readiness an abundance of linen which has been repeatedly boiled. Old linen is preferable, as it may become soiled, and it might be necessary to destroy it. Several pillows are required, and an abundant supply of towels and bed-linen should be in readiness. For the confinement, the bed should be narrow and high, with firm mattress, and made up with a rubber draw-sheet covered by a white draw-sheet in the center of the bed, and above the first linen and draw-sheet there should be placed a complete second outfit. This enables the nurse to take away the soiled linen upon the under, or cleaner, outfit, leaving the patient comfortable. It is usually necessary to pin the draw-sheet and rubber sheet to the mattress with large safety-pins, to keep the sheet smooth beneath the patient.

Basins and Clothing.—The nurse will require several basins and toilet pitchers, a plentiful supply of hot water, a large piece of new and pure Castile soap, several slop-jars, and a small clean agate or tin basin is also useful.

The patient may utilize old underclothing for her confinement. Unless the weather is very hot, she needs to wear light woollen or silk and wool undershirts. Old night-dresses are useful for this purpose, and they may be slit down the front or the back for ease of application. When the patient begins to sit up in bed dressing-sacques are useful, and when she begins to get up a wrapper or bath-robe or dressing-gown is useful.

Some form of douche-pan or bed-pan will be needed. The ordinary earthen bed-pan usually answers the purpose, although agate-ware douche-pans are better. A commode will be needed when the patient begins to leave her bed.

Ligatures.—In preparing for the child, the nurse is

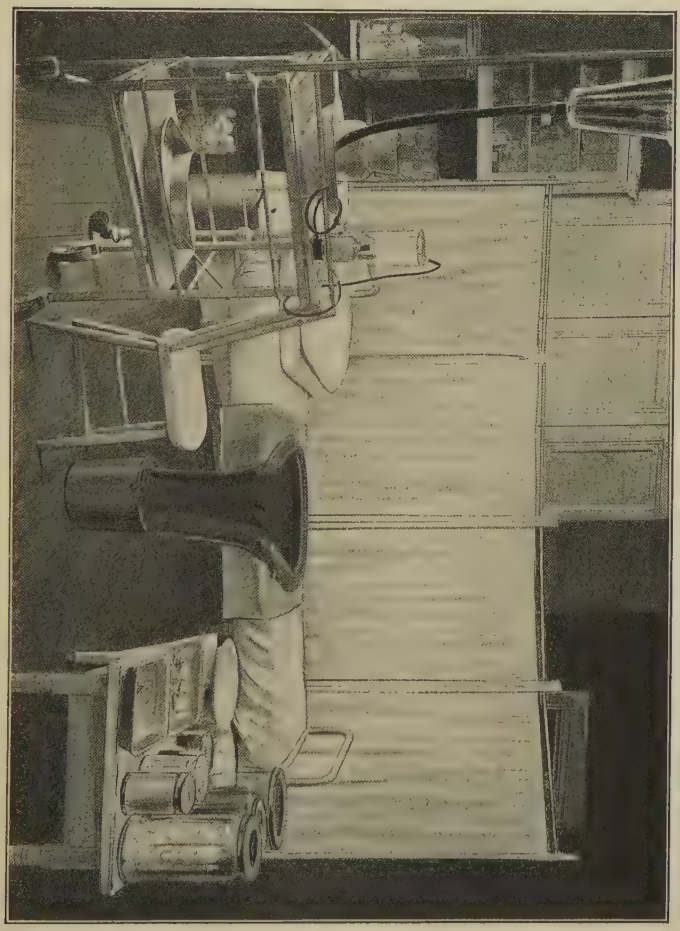


FIG. 12.—Delivery bed, with table, basins, douche-stand, small table, jars, etc., showing everything ready for labor.

often expected to provide ligature material for tying the umbilical cord. A thin, narrow tape, called bobbin, is sold in the shops, or a good ligature may be made by tying several strands of coarse linen thread together, boiling them thoroughly, and keeping them immersed in boric-acid solution. Many physicians bring with them the material for ligating the cord, and boil it in the sterilizer, which they also bring. Various sorts of material are used for the cord, and it is well for the nurse to ask the physician his preference before the confinement occurs.

Baby-clothes.—The baby's outfit consists of toilet articles and clothing. The former are usually arranged in a basket, known as a baby basket; while the latter are generally prepared during pregnancy and put away in readiness. A simple but sufficient outfit for a baby would consist of the following:

One dozen white slips.

Six flannel slips with sleeves, for night.

Six flannel slips with sleeves, for day.

Six woollen woven shirts with long sleeves.

Six knit abdominal bands.

Baby's hair-brush.

Powder-box and puff.

Four dozen diapers, not too large, and made of cotton diaper, twenty-two inches wide.

One dozen medium-sized safety-pins.

Four soft wash-cloths.

One dozen soft towels.

Two bathing-aprons of flannel.

Two light and soft shawls.

One half-dozen to one dozen pairs of knit socks.

Crib.—A crib, or bed, for the child is usually selected.

This should be without rockers or swinging motion, should be plain and simple, and one which can if necessary be thoroughly cleaned. In cases in which it is desired to keep the child especially warm and to move it about readily, an ordinary clothes-basket lined with blankets and pillows makes an excellent temporary crib.

CHAPTER V.

THE DUTIES OF THE NURSE DURING THE PATIENT'S LABOR.

The First Stage.—The first stage of labor is especially that which comes under the care of the nurse. During this period there is little which the physician can do to expedite birth. Dilatation of the womb must take place, and very gradually to avoid injury, and this process occupies a number of hours. If, however, the patient is not properly cared for at this time, she may lose physical strength, become mentally exhausted and depressed, and the progress of labor be temporarily or permanently checked. The nurse must see to it that the bowels are thoroughly and gently moved by a copious rectal injection. The formulæ which have already been given in treating of the constipation of pregnancy are suitable for this purpose. The bladder must be emptied at frequent intervals; and should the patient not be able to accomplish this the use of the catheter is necessary. The catheter should be passed by direct inspection, the hands of the nurse having previously been cleansed with soap and water, rinsed in hot water, and then brushed with mercuric chlorid solution (1 : 2000). The catheter should have been boiled for fifteen minutes. For pregnant cases the soft-rubber catheter is safest; the glass catheter should not be used, as the urethra is often subjected to considerable pressure and the glass catheter might wound the parts. With the catheter, boil six

cotton sponges to cleanse the parts. The tissues about the opening of the urethra should be thoroughly cleansed with sterile cotton and boiled water, and then with bichlorid solution (1 : 4000). The catheter should be lubricated with sterile glycerin or sterile olive oil.

Vaginal injections before labor should never be given without the precise order of the doctor. If douches are used, the physician should prescribe the medicament which is to be given, and the quantity and the temperature at which the douche is to be used. He should also state clearly the number of douches to be given in twenty-four hours.

In addition to emptying the bowel and bladder, if labor is just beginning, the patient should wash herself thoroughly with soap and water, washing the genital organs with especial care. Sponges should not be employed, but wash-cloths which can be boiled should be used instead. Physicians sometimes direct the nurse to shave the hair which grows about the genital organs, or to cut it away as closely as possible with scissors. In addition to thorough washing of the external parts, they should be cleansed with sterile water and with such antiseptics as the doctor orders. Usually bichlorid of mercury 1 : 2000 is used. Her clothing should be arranged so as to be as comfortable as possible. In cold weather a thin woollen undershirt or vest, an old night-dress, a bed-room wrapper, woollen stockings, and easy slippers should be worn. In warmer weather lighter clothing is necessary. It is often customary to braid the hair in two portions, as it is thus most comfortable during the patient's labor.

It is well to avoid a heavy meal of solid food at this time. As labor proceeds and the mouth of the womb opens the patient is frequently nauseated, and she may

be obliged to take an anesthetic during labor, when the presence of solid food in the stomach is very undesirable. The best food for this period of labor is that which leaves no residue in the stomach. Chicken-broth, mutton-broth, beef-juice, or other nourishing soups and broths, with a small quantity of bread, are suitable. An abundance of water should be taken, and a moderate quantity of tea or coffee if the patient desires it.

If the labor is the first, during the early stage the patient should be encouraged to be up and about, because this favors the descent of the child. When pains occur she may lie down or sit, leaning the body forward and grasping a chair in front of her as a support. As the pains increase in severity the patient will be forced to lie down until the birth occurs. Where the patient has had children previously, she cannot be up and about so long lest a precipitate birth should occur. So soon as active pains begin the patient will usually lie down in these cases. When the patient assumes the recumbent posture in natural labor she should lie upon the left side, the head and shoulders slightly raised, and the thighs flexed upon the body. This posture favors the descent of the fetus, and also its progress through the body of the mother.

As many labors occur at night, the nurse should watch closely to see that the patient does not become exhausted from lack of sleep. When the pains are simply nagging without increasing steadily in vigor the nurse should report this fact to the physician, and thus give him the opportunity for prescribing something to give the patient rest. In some cases, where weakness is apparent, the physician will order stimulants at regular intervals during labor. They should not be given without his orders.

A most important function of the nurse during this part of labor is her mental control of the patient. Very frequently she is asked many questions about the course and progress of labor. She should give such explanations as good sense dictates, never relating anything of a depressing nature. *She should never speak of possible complications or of severe cases which she has seen, nor of operations at which she has assisted or of remarkable recoveries from dangerous illness.* Her attitude should be that of patience and hopefulness, while she must absolutely avoid the expression of her own opinion. She must also carefully abstain from stating the probable duration of labor, as this is something which no one can absolutely foretell, and regarding which the patient naturally desires information.

As the first stage of labor draws to its close the nurse must utilize the time in preparing for the second, or active, portion. A plentiful supply of hot water must be always available. Stimulants, antiseptics, dressings, utensils, and the necessary articles for the child must all be in readiness. After the membranes rupture an antiseptic dressing must be worn over the vulva. Material should be in readiness for the cleansing of the doctor's hands, as upon his arrival he will usually make a vaginal examination.

The Second Stage.—During the second stage antiseptics should be kept in constant readiness for the cleaning of the physician's hands, and also for cleansing the external parts of the patient at the time of examination. During the second stage of labor, the nurse must exercise especial caution to maintain thorough antisepsis in her hands and clothing. The hands should be repeatedly disinfected, and if a fresh dress is not worn,

the clothing should be covered by a sterile gown or by a large sterile apron. Under no circumstances should the nurse introduce a finger within the vagina, and she should take especial precautions in cleansing the patient to introduce nothing within the birth-canal. The physician is usually present at this time, and the nurse's duties consist in having needed articles ready, and in assisting the patient to sustain her strength. Many patients during the second stage of labor suffer from pain in the lower portion of the back, and frequently request the nurse to rub the back or support it by pressure. An anesthetic is often given to a very mild degree of anesthesia, and the nurse should be competent to assist in this. Just before the birth occurs the physician may give the anesthetic into the charge of the nurse, instructing her to use it freely at the moment when the head is born. If ether be employed, it should be given in small quantities constantly inhaled, care being taken that the lips and face of the patient are not irritated by the ether. If chloroform is used, much less is required to produce an effect. Cold cream or vaselin should be applied to the face before anesthesia. At the moment when the child is born the nurse should have in readiness a warm blanket; ligature for the cord and scissors should also be ready. Many physicians have a hypodermic syringe filled with strychnin solution and another filled with aseptic ergot ready for use. When the child is born, the nurse should be ready to receive it in a warm blanket so soon as the doctor has tied and cut the cord.

So soon as the head of the child is born a slight pause often occurs, and if the conditions are favorable the nurse may wipe the eyes of the child with a small square of

very soft linen soaked in a saturated solution of boric acid. So soon as the birth of the child occurs the physician will allow a few moments to elapse before tying and cutting the cord. During this time it is well to wipe out the mouth of the child with soft linen soaked in boric-acid solution, that it may be freed from mucus, and that the child may not inspire mucus into its bronchial tubes. The discharge of matter from the mouth is much facilitated if the child be held by its thighs and legs with the head downward. Some physicians prefer to crush the cord with forceps before tying it, and apply forceps to the placental end of the cord to control hemorrhage. Two pairs of forceps should always be in readiness for those physicians who prefer this practice. So soon as the child is born, the pillow may be removed from beneath the patient's head. She must be cautioned not to raise her head suddenly.

The Third Stage.—During the third stage of labor the duties of the nurse are to have ready a plentiful supply of hot water, at least two quarts of such hot antiseptic solution as the physician orders, to have antiseptic dressings available, fluid extract of ergot, and usually the physician's hypodermic syringe is prepared for use. As the physician delivers the placenta the nurse should hold a basin in which a towel is laid under the patient's thigh, to receive the placenta. The physician will usually remove clots from the vagina, placing them in the basin with the after-birth. When the placenta has been removed ergot is usually given, and any stimulant required, and the physician will examine the patient for lacerations.

Physicians often prefer to have the patient placed across the bed, with her hips at the edge, her feet supported on

two chairs, or the lower extremities supported by a sheet folded lengthwise placed underneath the neck, and each end tied around the outer side of the leg just below the knee. With the patient in this position the physician often delivers the placenta by expression by Créde's method. This position is convenient for the inspection of the parts to ascertain the presence of lacerations.

A douche can conveniently be given with the patient in this position, and lacerations repaired if necessary.

Lacerations.—The nurse should never undertake the responsibility of deciding that lacerations are present. This is a most important matter, in which the nurse may bring upon herself just blame. If the physician requests her to tell him whether a laceration is present or not, she should respectfully decline to do so, saying that she is not competent to make the examination. If there are no lacerations requiring suture, the physician usually instructs the nurse to clean and dress the patient, and the puerperal period may be said to have begun.

Douches.—Many doctors have one douche given after each labor, to wash out thoroughly clots from the vagina and for antiseptic precaution as well. If the physician has confidence in the nurse, he requests her to give the douche; if not, he gives it himself. The nurse is responsible for the aseptic condition of the douche-tube and douche-bag, for the correct temperature and composition of the fluid employed, and for keeping the douche-bag full or at least partially filled during the entire administration of the douche. She should warn the doctor before the fluid has entirely escaped, as otherwise air may enter the womb and a serious accident follow. There are various kinds of douche-tubes in use, those sold with the ordinary fountain-syringe being of hard

rubber. The best tubes are of glass, made especially for the purpose, which can be thoroughly boiled. The accompanying illustration shows a tube devised by the writer, which is boiled before use, and which serves

FIG. 13.—Davis's glass douche-tube.

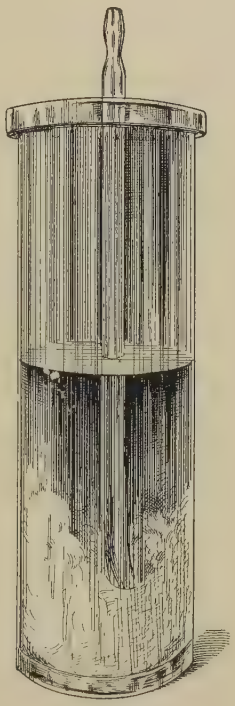


FIG. 14.—Glass douche tube in jar of antiseptic fluid.

equally well for an intra-uterine douche-tube when such is necessary. The nurse is also responsible for the aseptic condition of the douche-pan or bed-pan employed in the giving of this douche. Some physicians

prefer to place the patient across the bed, a rubber sheet beneath. In giving the douche the fountain-syringe should not be higher than three feet above the patient. After the douche has been given, or if no douche be given, the nurse should thoroughly antisepticize her hands, and then exposing the parts should thoroughly sponge away blood and discharges with bichlorid solution (1 : 4000 to 1 : 2000). The doctor should order the strength of the solution. This should be done with gauze or cotton sponges. *A sea-sponge should never be used about a puerperal patient.* When the parts have been thoroughly cleansed and dried, an antiseptic dressing should be applied, attached either to a binder or a T-bandage, as the physician may direct.

The Binder.—The application of the binder is a matter which must be decided by the doctor. If there is danger of hemorrhage, the binder should not be applied. If the nurse is told to proceed with its application, she must first be sure that the uterus is well contracted, being hard and firm. To apply the bandage properly, it must be fastened from above downward. The uterus should be brought downward and forward against the brim of the pelvis. The purpose of the binder is to carry the abdominal viscera down against the womb, and, pressing the abdominal walls gently but firmly, to retain the uterus in position against the pelvic brim. If the binder be pinned from below upward, it may push the womb up into the abdominal cavity, and relaxation of the uterus and hemorrhage may result.

Labor without the Doctor.—Cases sometimes arise in which the nurse is left entirely alone with the patient at the time of labor. The physician does not reach the case in time, the labor is precipitate, and the nurse is

called upon to deliver the patient. Fortunately, in these cases, there is no serious obstacle to the expulsion of the child, or birth could not occur so rapidly. Under these circumstances the nurse should place the patient upon her left side at the edge of the bed, drawing up the thighs and placing a pillow made into a firm roll between the patient's knees, thoroughly cleaning the hands, and placing a basin of bichlorid solution (1 : 2000)

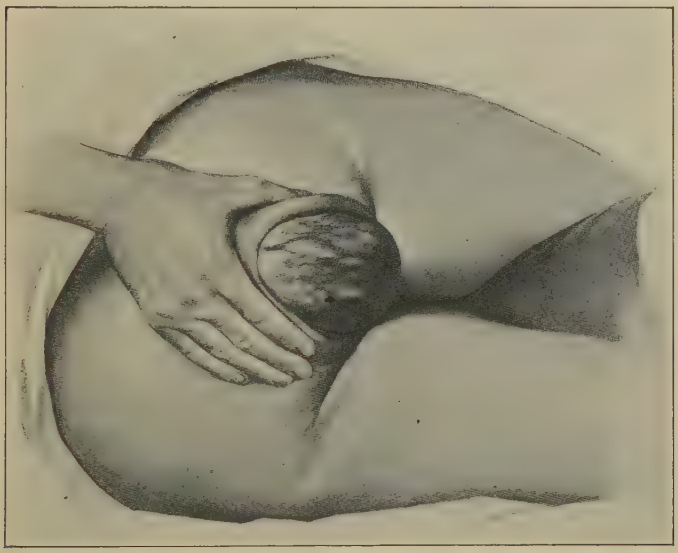


FIG. 15.—Protecting the perineum in normal labor (Bumm).

at her side, with gauze or cotton sponges in the basin. The nurse should lay the right hand across the perineum of the patient, a gauze or cotton sponge being placed over the anus. The hand should not completely cover the perineum, but should leave a half inch of tissue at the vagina uncovered. As the head comes down the

nurse should gently support the perineum and pelvic floor, making pressure upward and backward. If the head comes so rapidly that it seems in danger of tearing, the nurse may pass her left arm between the patient's thighs, placing the fingers of the left hand upon the top of the child's head and holding the head back. The mother should be told to open the mouth widely, not to bear down, and to breathe as slowly as possible. The nurse must then watch her opportunity to let the head slip out before the mother has a hard pain. In this way a serious tear can usually be avoided. When the head has been born the nurse should pass the finger to the neck, to see if the cord is around the neck. If it is, it should be slipped over the head if possible. When the shoulders are born the head of the child should be raised up with the left hand, while the right hand protects the perineum. So soon as the child is born it is turned upon its right side. The nurse should grasp the womb through the abdominal wall with one hand, and with the other feel the pulsation of the cord. If the cord is not beating, it must be tied an inch from the umbilicus, and in a second place just beyond, and cut between the two ligatures. If the child does not breathe and cry, it must be held with the head down and folded and unfolded upon itself gently, when respiration will usually become established. When the child breathes and cries it may be taken away, wrapped in a warm blanket, and placed upon its right side.

The mother is then turned upon her back, and the nurse sits by her side holding her hand gently but firmly upon the uterus. She should make no effort to deliver the placenta until the mother has contractions of the

uterus or unless hemorrhage begins. If the doctor does not come in time to deliver the placenta, and if the mother has pains, the nurse should assist the pains by

FIG. 16.—Delivering the placenta (Dickinson).

pressing the womb downward and forward, and by grasping it between the thumb and the fingers placed behind it, and compressing the womb from before backward. When the placenta appears at the vulva the nurse should grasp it and rotate it, drawing gently downward and backward, so that the membranes will twist into a cord.

In this way all the membranes come away. The placenta must always be saved for the doctor's inspection. After the delivery of the placenta, the doctor still being absent, the nurse may give a teaspoonful of fluidextract

FIG. 17.—Extracting the head, breech labor.

of ergot, see that the womb is firmly contracted, and, if the patient does well, may apply the binder and clean and dress the patient as usual.

Labor with Breech Presentation.—The child is

sometimes born with the head coming last and the feet and breech first. These cases are dangerous to the child, because at the moment of birth the neck of the child may be compressed and the child may die. If a nurse were alone with such a case, when the feet and limbs of the child appear the mother must be turned across the bed, her feet resting on a couple of chairs. The nurse should wrap the body and limbs of the child in a warm towel and support the body very gently until the body is born. Then the body should be raised toward the mother's abdomen with one hand, while the other is placed just above the pubes, and pressure is made downward and backward. The mother should be told to close her mouth and bear down as strongly as she can, when the arms and head of the child will be born (Fig. 17).

Twin Labor.—If a nurse were alone with a case of twin labor, after the first child has been born she should wait, encouraging the patient and keeping the hand upon the uterus. Twins are rarely as large as other children, and there is not much difficulty in their birth unless some complication occurs. When the second bag of waters ruptures the second child is usually born easily. There is danger, however, that the womb will not contract promptly, and so the nurse must be very careful to keep her hand upon the uterus, and to see to it that the womb does not relax. When the patient begins to expel the placenta the nurse should assist her by compressing the uterus in the manner already described. There is great danger of post-partum bleeding in twin labor, and so the nurse must be especially careful to see that the womb is well contracted before she applies the binder. If there is any tendency to relaxation, two teaspoonfuls of ergot should be given at once, and one teaspoonful every hour for the next two or three hours.

CHAPTER VI.

THE PUERPERAL OR LYING-IN PERIOD.

Duration.—The time required for the complete recovery of a mother from labor varies greatly. From six weeks to three months usually elapse before the patient is entirely well, and in some cases a still longer period. As the patient is in bed a part of this time, it has been termed the lying-in period, or the time of confinement. Formerly it was thought that one month was sufficient for the services of a nurse, and so obstetric nurses were called monthly nurses.

Involution.—During this time the womb and other portions of the genital tract are becoming smaller, until they are nearly in the condition in which they were before pregnancy occurred. This process is called involution. Wounds in the soft tissues during labor gradually heal. The abdominal muscles which were stretched contract and become nearly as firm as before. The secretion of milk is established and continues. Some patients lose in weight while nursing the child, while others gain. The majority of healthy women gain after childbirth. The mother is never so small as before her pregnancy, unless artificial means be used to compress her body. She is larger about the waist and about the chest than before.

Lochia and Bowels.—The lining membrane of the womb is shed off during the lying-in period, and with the discharge of other tissue from the uterus forms the lochial

discharge. This is at first bloody, then serous, and lastly mucous. It is altered in cases of septic infection. The intestinal tract of the patient has been usually distended with feces during pregnancy. After the bowels have been emptied the intestines gradually regain their normal size and elasticity.

Rest.—The first absolute necessity for the mother in the lying-in period is rest. It is sometimes very hard to persuade her friends and relatives that such is the case. Joy over the birth of the child, curiosity to see it, and general excitement disturb the mother very much. It is the duty of the nurse, however, to see that when the mother has been properly cleansed and suitable dressings applied, and her bed made clean and comfortable, that the room should be darkened, and that the patient should enjoy perfect quiet, and if possible several hours of sleep. Although the mother rests the nurse must remain watchful. She must know that the patient's pulse is good; that the flow of blood from the uterus is not excessive; that the patient's extremities are warm; and that her sleep is a healthful and restful one, and not a dangerous unconsciousness caused by bleeding or fatal syncope. If the nurse is negligent, a mother may bleed to death while the nurse supposes her to be asleep.

Soiled Linen.—While the patient sleeps the nurse will have time to wash and dress the child, to place linen and other articles soiled during the labor in cold water to soak, and to make the rooms which have been used neat and tidy. If linen or clothing has become much blood-stained, it should be soaked in cold water containing sodium bicarbonate. If it be repeatedly rinsed, the blood will entirely disappear, and the clothing may then be washed in the usual manner. Clothing or other

articles stained with blood should never be washed in hot water or boiled. The heat coagulates the blood, making the cleansing very difficult.

The Newborn Child.—When the mother wakes from the first sleep her natural desire will be to see the child. If she is in good condition, and the child also, this desire should be gratified, and the opportunity should be taken to put the child to the breast. This is done because the child's nursing will increase the contractions of the womb and stimulate the flow of milk, while the child may obtain fluid useful in moving the bowels. Before the child nurses, its mouth should be wiped out with a small square of clean linen dipped in a saturated solution of boric acid. The mother's nipples should be washed with Castile soap and warm water, and then with boric-acid solution before the child nurses. After the child nurses the nipple should be sponged and dried with linen soaked in boric-acid solution.

It is often difficult to induce the child to take the nipple for the first time. If the mother takes the child upon her arm and turns upon her side, the breast will naturally fall so that the nipple will come easily into the child's mouth. It is usually unnecessary to do more than simply moisten the nipple, when the child will nurse eagerly. But little fluid is present in the breast at first, and the child after trying for a moment may desist because it obtained nothing. As the secretion of milk increases the child will increase its efforts to nurse.

Cleanliness for the Mother.—It is very important in the lying-in period that the mother should be kept clean, and that she should have abundant and proper diet and sufficient rest. Her room should be absolutely

neat, the bed-linen changed as often as necessary, the antiseptic dressings frequently renewed, and in every particular the patient and her surroundings must be models of neatness. If the nurse manages well, she will do her work at regular times, conforming to the habits of the patient and the household, and thus the care of the patient will go on smoothly.

Each puerperal patient requires at least one thorough soap-and-water sponge-bath daily. This is best given in the morning, usually about an hour after breakfast. The use of highly scented soaps is objectionable, and a wash-cloth is preferable to a sponge. Water or wash-cloth used in general bath must not be used for vulvar cleansing. Careful attention must also be given to the patient's hair that it does not become uncomfortably matted or tangled while she is in bed. If it is grateful to the patient, she may also have light rubbing with alcohol in the evening, about an hour before the time when she goes to sleep.

Massage and Posture.—During the latter portion of the puerperal period massage is a most important method of advancing the patient's recovery. This should be given very gently at first, the back and limbs only being treated. Later on, the entire body, including the abdomen, may be subjected to massage with great benefit. In caring for the patient's skin while she is in bed, it must be remembered that some persons cannot lie upon rubber sheeting without considerable suffering, and sometimes with unpleasant eruptions. When this is the case the rubber draw-sheet may be removed, and pads made of cheesecloth and filled with borated or sterile cotton may be used instead. If attention be paid to the proper application of vulvar dressings, these pads will usually be found sufficient. The posture of the lying-in patient is of importance. Immediately after delivery she

FIG. 18.—Breast and abdominal binders and upper end of vulvar dressing.

should lie quietly upon the back, and remain so until she has perfectly reacted from labor and until all danger of hemorrhage or relaxation of the uterus is passed. After this it is injurious for the patient to lie constantly upon the back, because this posture favors tipping backward of the womb. So soon as the mother can move about comfortably in bed she should turn on either side; or, if she desires, she may lie upon the abdomen. The shoulders are not usually raised from the bed for several days after confinement, but the patient may be gradually propped up in bed, with the doctor's permission, until she assumes very nearly the sitting posture.

Light and Air.—The day is fortunately past when it was thought necessary to keep the room of a puerperal patient dark and close. So long as the patient is fatigued she naturally does not desire a bright light; but when she is not asleep the light in the room should be that best adapted to her comfort. Excepting in hot weather, abundant sunshine is an excellent thing for such a room, and should be admitted most freely. The ventilation of the lying-in room should be as perfect as possible. This may be accomplished by raising the lower sash of one or two windows and placing beneath it a strip of board containing a ventilator or without it. An air space is thus formed between the upper and lower sash which prevents a draft. An open fireplace is also of the greatest assistance in securing good ventilation. Screens such as are used in dining-rooms and other apartments may be utilized to avoid drafts.

Mother and Child.—The mother very naturally desires to have the child near her. Its presence, however, in her room is most undesirable. Many newborn children are restless at night for the first week or ten days after

birth, and if they be in the room with the mother she must necessarily be disturbed and lose important rest. The child is often put in the room with the nurse, this arrangement enabling her to care for the child without disturbing the mother. The child's room may be near the mother's and adjacent; but there should be a door between them sufficiently heavy to prevent the mother from hearing the child's cries. Where it is impossible to keep the child in any other than the mother's room, the best must be made of such an arrangement, but it will result in much fatigue for the mother.

Warmth.—While the lying-in room should be well ventilated, it should also be comfortably warm. Immediately after labor the patient experiences a considerable reaction and often complains of a chilly sensation. The best form of heat is an open wood fire. Next to this is an open stove burning hard coal; while worst of all is a register from a furnace, which brings heated and foul air from the cellar of the house.

Bowel Movements.—Within the first forty-eight hours after labor the mother's bowels should be thoroughly but gently moved. Almost no pregnant woman escapes constipation, and while the intestine may seem to be empty at the time of labor such is rarely the case. The medicine prescribed by the physician is usually followed by an order for an enema, the composition of which should be directed by the physician himself. If this be left to the nurse, an enema of castor oil, soapsuds, the yolk of a raw egg, and turpentine is usually found sufficient. In cases in which the breasts are very full it may be desirable to produce a very free evacuation, and then an injection of Epsom salt, glycerin, turpentine, and soapsuds may be employed. After the bowels have been

thoroughly evacuated they must be moved regularly by the simplest remedies which will act. While the lower bowel can be cleansed by enemas, the upper portion of the intestinal tract is not much affected in this manner.

Diet.—The diet of the mother after labor should be liquid. An abundance of water must also be taken. The use of liquids is necessary for the formation of milk, to stimulate the action of the kidneys and intestine, and to appease the mother's natural feeling of thirst. Water and milk are the best beverages; the lightest forms of cocoa are acceptable to some, but tea and coffee should be used in small quantities only. Some think that coffee lessens the secretion of milk and that tea increases it. There is no positive evidence that either belief is correct. Liquid food may be given every three hours and once during the night. When the bowels have moved the patient usually has a better appetite and craves solid food.

Very few patients while in bed need much meat or can digest it. The diet for such cases is that usually known as light diet in hospitals. It comprises soft eggs, custard, junket, milk-toast, light puddings, broths, soups, purées, calve's-foot jelly, partially melted ice-cream, toast in all forms, sponge-cake, charlotte russe, all vegetables in season, non-acid fruits, raw if perfectly ripe, and, if not, cooked, baked apples being of especial value if not too sour. At the end of the first week of the puerperal period the patient may add to this diet once daily the white meat of chicken or turkey, squab, sweetbread, lamb chops, oysters, and fish, excluding other shell-fish. When she begins to be up and about her room beef, bacon, and potatoes may be added. Fried dishes, pickles, nuts, candies, cheese, rich sauces, pastry, highly spiced food, and alcoholic drinks should be excluded at all times.

It is customary in many cases to order malt in the form of an extract or a mild liquor for puerperal women. This is done to increase the secretion of milk and to build up the patient's strength. Malt liquors are not needed by nursing women, while it is easy to push the administration of malt too far, thus overtaxing the digestive organs and bringing about a very unfortunate condition. If malt is employed, the thinner, lighter extracts should be chosen, and it should be taken with food, a wine-glassful at a dose three times daily. A puerperal patient needs plenty of the most nutritious food, but it must be remembered that any but simple food affects injuriously the milk, and will interfere greatly with the child's comfort and her own as well. Acid fruits eaten by the mother frequently cause indigestion in nursing children, and rich and indigestible foods are well known to produce such a result.

Asepsis and Drainage.—The puerperal woman is a surgical patient. If a nurse is caring for a case of abdominal section, the wound in the abdominal wall is kept covered by an antiseptic dressing, which is renewed, if necessary, with the greatest care. It is much easier to keep a case of abdominal section in an aseptic condition than a puerperal patient. The wounds in the genital tract after labor cannot be closed by the direct application of a dressing. These wounds must discharge, because from the uterus must escape the cells which formed the uterine lining during pregnancy. The uterus must drain; and if it does not, then absorption of lochia will follow and sapremia result. Hence the puerperal patient must be treated surgically with proper precaution.

Fortunately, the provisions of Nature for the drainage of the birth-canal are usually sufficient, and if nothing

unclean comes in contact with the patient she remains in an aseptic condition. There may be within her body the results of inflammation before this labor, but that cannot be helped by the nurse, and she is not responsible for them. When it is necessary to change the vulvar dressings the nurse should scrub her hands with soap and hot water, then with hot water, and then with a solution of mercuric chlorid (1 : 2000). There should be ready a basin of bichlorid solution (1 : 4000 or 1 : 2000), as the physician may direct. In this should lie pieces of sterile cotton or of sterile gauze. The clean dressing to be applied should be in convenient reach. The nurse should place beneath the patient a douche-pan or bed-pan, or if she cannot be placed upon such a vessel a mass of cotton or of gauze should be placed beneath the vulva. Some nurses prefer to irrigate the external parts with a stream of antiseptic fluid running from a fountain-syringe or small pitcher. Others use simply gauze or cotton sponges. To cleanse the parts, the nurse, with antiseptic hands, irrigates or sponges the external parts thoroughly. Then, separating the labia with the fingers of the left hand, she directs a stream of antiseptic fluid from a fountain-syringe or small pitcher upon the external parts and the entrance to the vagina, washing these parts perfectly clean. If a syringe or small pitcher is not used, she should saturate a handful of gauze or cotton with the antiseptic fluid, and, holding the labia apart with the left hand, the right should be placed above the parts, the gauze or cotton squeezed, and the fluid allowed to run over the parts. No finger or instrument should be inserted within the vagina without the doctor's precise orders. When the parts are thoroughly cleansed the external parts may be gently dried with gauze or cotton sponges. The fresh dressing is then applied. In some

cases physicians order that in addition to the usual cleansing an antiseptic powder of some sort be dusted upon abrasions and small lacerations at the entrance to the birth-canal. This, of course, must not be done without the doctor's orders. Soiled dressings when removed should be wrapped in waste paper and burned. They should not be placed in a furnace, as the fumes may pass through the flues of the house. They should be burned in a range, a stove, or fireplace at the most convenient time. Very often during the night the nurse can succeed in burning the day's dressings in the kitchen range. The nurse should watch carefully for evidences of a foul discharge on the napkins, from inflammation or irritation caused by the dressings or antiseptic solutions employed. Dressings should be changed and the patient cleansed whenever the dressing is stained through, whenever the bladder or bowel is emptied, and as often as the physician may direct.

The Breasts.—As the nipples of the mother may become wounded, it is necessary to protect them with aseptic dressings. The test of the value of a breast-binder is the comfort which it gives the patient. It should hold the breasts gently but firmly, raising them and drawing them inward toward the middle line. The nipples should be covered by the softest possible aseptic materials; sterile gauze usually answers the purpose very well. After the baby nurses the nipples should be thoroughly but gently cleansed with sterile water or with some antiseptic solution which the doctor will order. Many physicians employ a saturated solution of boric acid. When the nipples are tender and a crack or fissure is feared, an antiseptic ointment may also be employed

to advantage. Other physicians prefer a simple sterile fat, as sterile olive oil or cocoa-butter.

Catheter.—It is often necessary to catheterize a puerperal patient, and this requires the strictest antiseptic precautions. The catheter must be boiled, the hands of the nurse made aseptic, and the patient's parts gently but thoroughly cleaned with antiseptic solutions.

Asepsis.—No instrument or utensil or appliance which is not surgically clean should be used about the puerperal patient. It may seem unnecessary to be so exact in small things regarding asepsis during the lying-in period, but patients unfortunately sometimes suffer from infection of the breasts and nipples, or from infection of slight wounds in the genital tract through the carelessness or inefficiency of nurses. Every precaution must be taken in emptying the bowels by enemas that the perineum may not become soiled with fecal matter, and that wounds or lacerations do not become infected.

While it is difficult to prove positively that a patient may become septic from septic air, still cases are on record which seem to show that air coming from septic material may poison a lying-in woman. An example of this is as follows: A nurse in a lying-in hospital placed soiled dressings in a furnace in which there was no fire. The air from this furnace passed through a register at the bedside of a patient. This patient became septic. The next patient placed in this bed also became septic. When the furnace was cleaned and the dressings removed patients placed in this bed did not become septic. There should be no communication for this reason between the lying-in room and any sewer, drain, or cesspool. Fortunately, antiseptic agents are not all of them possessed of unpleasant odor, and hence a patient may be treated with

every antiseptic precaution without disagreeable odor. The placenta should be destroyed by fire, or, if this is not possible, it should be buried several feet below the surface of the ground. It should never be placed in a water-closet or drain-pipe.

Visitors.—The regulation of visits made by outsiders to the patient is often a matter of difficulty. There are many reasons why but few people should call upon such a case. The patient's exhausted condition immediately after labor forbids it. The child is more interesting to her than any visitor, and hence she needs little if any other society, while each visitor may be a source of danger through the conveyance of some contagion or infection. Unfortunately, it is not often possible to select visitors for their beneficial character upon the patient. Still, only those persons known to be in good health and free from contagion, and cheerful and encouraging by nature, should ever be admitted. It is usually best to limit visitors to the patient's nearest friends until she is able to go out. Importunate persons can often be appeased if the baby is shown to them. This satisfies their curiosity, and gives them an opportunity of comparing the child with their own and others of their acquaintance.

Only those who have had experience realize the sensitiveness of puerperal women. They are easily excited, easily alarmed, and very readily frightened. Hence every precaution must be taken to keep the mother as happy and as undisturbed as possible. The results of excitement and alarm are seen in high fever, disordered milk, sickness of the child, and sometimes a very serious or fatal syncope in the mother. Knowing this, the nurse must guard her patient accordingly. This period is a restful and happy one for the mother, and the nurse has

it in her power to secure this desired result, but by her lack of tact and good management she may very much retard the recovery. If the nurse meets the family and visitors with firmness, but with courtesy and tact, she will rarely fail in securing the desired result.

Getting Up.—The question of the mother's getting up from confinement is one which is constantly brought to the attention of the nurse as well as of the doctor, and her friends. Women usually expect to be up and about on the tenth day after the birth of the child when the confinement occurs among the poorer classes. It is evident that there is no fixed limit for the lying-in period, but that each patient must get up in proportion to her recovery and to her strength. It is for the doctor alone to decide when the patient shall leave her bed.

The first beginnings of getting up are when the patient sits up in bed to eat her meals. Then she leaves her bed to use a commode, and then reclines upon a couch for the greater part of the day, finally sitting and walking about her room. So long as there is a free reddish discharge the patient should not be upon her feet. Very often the discharge becomes more abundant and red in color so soon as the patient gets up, and when this happens she must be more than usually cautious in assuming the upright posture. The average patient can leave her bed to use a commode at the end of ten days or two weeks, can be partially dressed and lying upon a couch during the third week, and up and about her room in the fourth week. Her going out of doors must depend upon the weather, upon her general strength, and upon the means at her disposal. She should go out at first in a carriage if this is possible, and begin to walk and take active exercise very gradually.

So soon as the patient gets about it is necessary that she should go up and down stairs. This is an especially trying and difficult exertion for a woman immediately after labor. She may be able to go down with the assistance of the baluster, but when she returns she should be helped by some one who stands beside her with the arm about her waist, lifting her upon each step, or, standing directly behind her, lifts her by placing the hands upon the hips.

Physician's Examination.—Before the patient is declared to be well and able to go about most physicians make a thorough internal examination to ascertain that no malposition of the uterus is present. To do this the physician requires hot water, soap, an antiseptic solution, and some lubricating material for the examining finger. The patient is placed upon her back at the edge of a bed, with her feet on chairs, and a bimanual examination is made.

The Mother's Figure.—Patients are often anxious about the getting back of the figure after confinement. By this many expect to be as small as they were before the birth of the child. It is often noticeable that patients who have especially bad figures seem very anxious that the figure be kept in its original proportions. Nurses are often asked if they bandage patients; and patients ask regarding the nurse, not so much whether she is clean, aseptic, and intelligent, as whether she is good at getting back the figure. As we have remarked, it is impossible for a patient to be as small after the birth of the child as she was before; and if her figure is of more importance than the child, then the birth of the child was certainly a calamity. If she makes a good recovery, however, the abdominal walls will be firm and elastic, the patient will

be able to stand erect, and to walk and exercise as she formerly did, and she will have quite as good a figure as she ever had. Some patients who were very thin and ill-nourished before the birth of the child become slightly stouter and much improved in looks after the child is born. The nurse should assure her patient that she will take every precaution to see that the patient makes a good recovery, and that if this occurs the patient will have a comfortable figure. The term "figure" is used by many to mean the human body as constricted by a corset. This is a deformity of very common occurrence, and is preferred by many to the natural shape of the body. If a woman after confinement desires a corset figure, she can obtain it by putting corsets on early, by lacing them tightly, and fastening her clothing around her waist so as to assist the corset in dragging and forcing down the organs in the abdomen. It is not the part of a trained nurse, however, to assist in producing any such deformity. If a patient does not desire to be deformed in this way, if she makes a good recovery from labor, she will be in better health and have a stronger and more graceful body if she will avoid the use of corsets, suspending the clothing from the shoulders and using styles of clothing which avoid constriction of the waist.

CHAPTER VII.

THE NEWBORN CHILD AND ITS CARE.

Physiology of the Infant.—The child comes into the world with only its physical nature developed, and with certain very definite needs and indications for its care. Its digestive apparatus is in a delicate condition; its stomach is but little dilated, and hence it requires easily digestible food in small quantities and at frequent intervals. The organs of digestion and excretion are not in a condition to perform their functions fully, and the same is true of the lungs. Hence respiration, digestion, and excretion become gradually established. Several days elapse before the lungs are fully expanded, while from several days to a week often pass before the kidneys and bowels act freely. The nervous system is in a delicate condition, capable of reacting to very gentle stimulation, and likely to be severely impressed by shock. The child appreciates heat and cold keenly, and hence gives evidence of its comfort or discomfort according to the temperature of its body.

The discharges from the intestines and kidneys are especially interesting in young children. The first bowel movements are dark, resembling tar or burnt molasses, and gradually give place to the bright-yellow movements which are seen in health. The urine first discharged stains the diaper a reddish pink, sometimes a brick color, and this stain gradually gives place to a colorless state of the urine or to a faintly yellow tinge. The gradual

change of the color of the discharges from the bowels and kidneys is an index of the activity of these organs and of the prompt establishment of the child's digestion. If the urine does not grow clear and the bowel movements remain black and thick, the child's digestion becomes established with considerable difficulty. During the first week or ten days the child is often jaundiced. This comes from the absorption of blood-pigment, and not because of disease of the liver. In healthy children it disappears in a short time.

At birth the stump of the umbilical cord is attached at the child's umbilicus and surrounded by an elevated rim of integument. The cord gradually withers, becomes black and shrivelled, and finally comes away, leaving a small granulating surface, which retracts and is almost covered by the skin.

The healthy newborn child sucks vigorously. It cries actively, moves its limbs freely, and has considerable vigor in the grasp of its hands and feet. Although the grasp of the hands is much the better developed, still it tries to hold objects with the toes, and if the object be small enough it may partially succeed.

Its First Food.—The craving for food which the child soon manifests is accompanied by considerable thirst. This is a wise provision of nature, as a free amount of fluid is necessary to flush the kidneys and establish the secretion of urine. Immediately after birth the mother's breasts rarely contain milk of an especially nutritious character. In most cases the fluid is thin, comprised of water, saline material, and young cells from the milk-ducts of the breast. This is a laxative much needed by the child. It is called colostrum, and gradually gives way to the fully formed milk. If the child were to

depend entirely upon the mother's breast for the first few days of its life, it would receive but little nourishment. It comes into the world, however, with a considerable number of red blood-cells and other nourishing cells in various portions of the body, so that it is not in immediate need of food. If abundant water be given, so that the circulation of the child can have fluid and the glands of its body begin to act, the child will do well. It should not be fed by artificial means unless the coming of the mother's milk is delayed beyond the usual period. For forty-eight hours the child will do well upon colostrum and water if it be a strong and vigorous child. If it be prematurely born and weak, it may require additional nourishment or stimulus.

Mother's Milk.—The mother's milk forms gradually, usually by the end of the first three days after birth. In some cases it comes into the breasts so suddenly that the sensation is that of a rushing fluid. In healthy, well-nourished women milk is present in the breasts in some cases from the early months of pregnancy, and often in considerable quantity during the last few months before labor.

The secretion of milk is greatly promoted by the stimulus of the child's nursing, especially if this be done at regular intervals. The attending physician should prescribe exactly the periods for nursing, and absolute regularity should be observed in carrying out his directions. At first the child usually nurses once in four hours, and once or twice during the night, for the first forty-eight hours. Then it nurses every three hours from 6 A. M. to 10 P. M., and once during the night; and when the secretion of milk is fully established, every two or three hours between six o'clock in the morning and ten o'clock in the evening, and once during the night. It is often difficult to keep a child awake during the day to nurse, although

it will remain awake at night and nurse freely for a considerable time. Still, the child should be roused at regular intervals, and in the course of a week or ten days it will form regular habits.

The Child's Stomach.—The capacity of the child's stomach gradually increases with the amount of food available. The natural measure of the infant's meal is the contents of one breast, and in the course of ten days or two weeks the secretion of milk will adapt itself to the appetite of the child, and sufficient, but no more, will be formed. The child should nurse the breasts in alternation, and before and after nursing the nipples should be cleansed with boric-acid solution or sterile water. If there is danger that cracks or fissures will form, the nipple should be anointed after each nursing with an antiseptic ointment or with sterile olive oil.

Nursing.—In some cases the child is slow in grasping the nipple in beginning to nurse, and the nipple must be moistened with water, or possibly with milk, before the child will grasp it actually. A solution of sugar is sometimes used to moisten the nipple, although this cannot be commended. In some cases the child nurses so greedily as to swallow a large quantity of milk suddenly, thus causing regurgitation and colic. The mother can do something to prevent this, if she will lay her hand across the under surface of the breast, grasping the nipple between the longest and the next finger and compressing the nipple as the child nurses. In this way the flow of milk is hindered and the child is obliged to nurse more slowly. In some cases the breast is so distended with milk that the child cannot cause the milk to flow freely. Here the tension must be lessened with the breast-pump by drawing two or three drams of milk, when the child will be able to nurse. In some patients

the first milk found in the breast is exceedingly rich in fat and does not agree well with the child. The use of the breast-pump to remove this milk before the child nurses is usually all that is sufficient.

The taking of food through nursing by an infant should be done with care and regularity. It is a great mistake for the mother to allow the child to drop asleep with the nipple in its mouth, as the constant sucking of the child upon the nipple has a tendency to soften it and to cause it to crack easily and fissure or become sore.

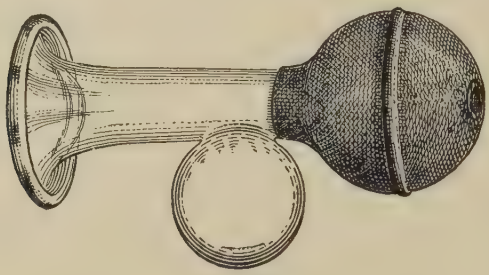


FIG. 19 —Breast-pump.

The time occupied by a healthy infant in emptying a normal breast is from fifteen to twenty minutes. When the child drops asleep and cannot be roused to nurse, then the act of nursing should cease.

Water.—In addition to the milk which the child obtains water should be given regularly by the nurse or caretaker. It is better to have water which has been boiled and cooled than to trust to water which has not been made sterile. An infant will usually take it from a teaspoon or bottle; but if difficulty is experienced in this, the water may be dropped into the mouth from a medicine-dropper. Until the secretion of urine is abundant and the urine is not highly colored, the infant should have water every four hours unless asleep at night. The tem-

perature of the water should be neither high nor low, but pleasantly cool.

Warmth for the Child.—The temperature of the newborn child is considerably above that of the healthy adult, and care must be taken that the infant does not become chilled. At the same time too great heat is most depressing and injurious. The most agreeable warmth for the child is that of an open wood-fire or of an open coal-fire, which gives a circulation of air. It is noticeable that infants that are not sufficiently warm almost immediately cry and fret, so that if a child is not hungry, and if its diaper does not require changing, we may suspect either heat or cold to be the source of its annoyance.

Sleep.—The newborn child spends a large part of its time in sleep, and this should not be disturbed except for very good reasons. As the child at first has no consciousness of the external world, it is useless to disturb it with the idea that it is an intelligent creature which can give response. It may be with the mother sufficiently often to interest her, but otherwise it should be allowed to sleep and rest in quiet.

Clothing.—Infants' clothing should be as simple and as comfortable as possible. The number of garments actually needed is very small indeed. A thin, soft woollen undershirt, an abdominal band or binder, a pair of socks, a flannel slip which combines a jacket and skirt, and a diaper are the only articles of clothing necessary. For neatness, a white slip may be worn over the flannel one. Several small flannel wraps of different weights and sizes should be in readiness for use when it is necessary to carry the child from its crib to the mother or from one room to another. When the child is dressed its two slips may be put on together by drawing the sleeves one

within the other. When it is old enough to go out a cap and heavier wrap will be necessary. The skirts of the infant's clothing should come but a short distance below the feet. All the clothing should be loose about the body, permitting the child to move freely. If the slips are too long, the movements of the feet are restricted, and the child does not develop so rapidly nor so perfectly.

Bathing.—Most infants are given a warm soap-and-water bath very shortly after their birth. This is done to remove the caseous material which very often smears the skin. If the child be rubbed with sterile olive oil before it is bathed, the caseous material will be removed more easily. Whether the bath be continued or not after the first cleansing depends upon the constitution and vigor of the child and the wish or belief of the attending physician. The first bath should be at a temperature of 100° F., with Castile soapsuds, and should be given in a warm room at a fireside if the weather be cold. Care should be taken to bathe the head and body with two different wash-cloths or sponges. There should be no hesitation in using soap freely upon the scalp, as sebaceous matter will become crusted upon the head unless this be thoroughly done. Many mothers and nurses prefer the use of powder after the child has been bathed. This is placed in the flexures of the limbs, in the armpits, and about the genital organs, to prevent the child from chafing by the folds in the flesh or by its diaper or clothing. In other cases a simple ointment is used or sterile olive oil is employed. If the child be bathed regularly, the bath is usually given in the morning, and the nurse must take care that the child is not exposed to chill. If possible, she should sit before an open fire, and should be surrounded by a screen to prevent draft. A bathing-

apron of flannel is especially desirable, and this should be double or having two layers. If the child is active and the nurse's clothing is likely to be soiled, she may put on first a rubber apron, and over this a double bathing-apron which is of flannel, soft and thick. The child lies upon the under thickness of flannel while it is rubbed and dried. Care must be taken that separate wash-cloths are used for the head and for the remainder of the body, in order to prevent the possibility of contaminating the eyes. Two wash-bowls should also be employed, or else the head and face washed before the remainder of the body. The eyes should never be rubbed with a wash-cloth, but should be cleansed by dropping sterile water in them from a medicine-dropper which is perfectly clean. In bathing the child the stump of the umbilical cord and umbilicus must not be moistened. This should be covered by sterile gauze or cotton during the bath. Bathing should be followed by gentle massage over the entire body. If the child is puny and ill nourished, massage may be combined with the inunction of oil by having the nurse anoint her hands with sterile olive oil or some other suggested by the physician in charge. Physicians differ regarding the use of the bath-tub. Some prefer that the child should not be put in the tub until the coming of warm weather if the child has been born during the winter. Others allow the child to be placed in the water so soon as the umbilicus is healed. In some cases the physician does not allow the child to be placed in the tub during its infantile life. Whatever may be done in this matter must be definitely prescribed by the physician in charge.

If the weather be excessively warm or the child be depressed from any cause and restless, it is often advan-

tageous to give it a sponge or rub with alcohol just before it is put to sleep at night. A quart of water at a temperature of 100° F., to which are added two tablespoonfuls of alcohol, makes a refreshing bath-mixture when the child is fretful and has a tendency to slight fever. Infants are occasionally ordered medicated baths for diseases of the skin or for a tendency to chafe. In bathing infants none but the purest soap should be used, and preferably without scent. Soft knitted wash-cloths, which should be boiled at least once weekly, may be employed. The child's body should never be entirely exposed during the colder months, but remain wholly or partially covered by the flannel bathing-apron. Considerable care and skill are necessary to give the child the greatest comfort with the least exposure and risk.

Massage.—After the morning bath, and before the infant is dressed, it may be given massage from ten to fifteen minutes. The nurse's hands should be thoroughly washed with warm water and soap, and then lubricated with olive oil or with some other pure fat. Physicians sometimes order inunctions after the morning bath.

Dressing the Umbilicus.—Care must be taken that septic infection of the infant does not occur through the umbilicus, the eyes, or the mouth. The stump of the cord should be dressed with some sterile absorbent material which can readily be kept in place by the abdominal bandage. Many employ sterile powders, using baked starch, or salicylic powder (seven parts) and baked starch (one part), or talcum powder, or powdered boric acid, or powdered zinc oxid. Others use no powder, but employ sterile or antiseptic gauze. Occasionally the cord is enveloped in sterile absorbent cotton.

When the umbilical cord is thick and moist and dries slowly, it may be dressed to advantage by wrapping it in cotton thoroughly soaked in 95 per cent. pure alcohol. This dressing is antiseptic, and causes the cord to dry rapidly. Whatever the doctor orders in this matter must be carefully carried out lest the child be exposed to danger from this source. To dress the umbilicus the nurse should wash her hands thoroughly and brush them in a solution of mercuric chlorid (1 : 2000). The soiled dressing should be removed very gently, avoiding traction upon the cord which might cause it to bleed. When the dressing has been unfolded and removed the umbilicus and cord should be very gently sponged with aseptic cotton and such solution as the doctor may order. The sterile dressing then prescribed should be applied, the stump of the cord being brought up toward the infant's right side and held in place by a smooth bandage of soft flannel pinned about the abdomen.

The Mouth.—The mouth of the infant must be kept aseptic by cleansing the mother's nipples before and after nursing, and by cleansing the child's mouth should grayish-white patches appear upon the tongue and the sides of the mouth. The nurse must remember never to put a dirty finger or article into the child's mouth, as otherwise infection may arise. Should it be necessary to cleanse the mouth, the softest linen should then be employed which has been repeatedly boiled and has been dipped in sterile water or boric-acid solution.

The Eyes.—The eyes should be protected from infection by thorough cleansing at the time of birth by flushing them with boric-acid solution or sterile water, as the doctor may order. After its birth the eyes may also be flushed with sterile water by the use of the

medicine-dropper, and any evidence of the formation of matter, sticking together of the lids, or redness about the eyes should be at once reported to the physician in charge.

Physicians often prefer to disinfect the eyes in newborn infants by the application of some preparation of silver immediately after birth. The physician should prescribe in writing the exact preparation to be employed, and should give written directions concerning its use.

If a solution of nitrate of silver be used, it is customary to drop one drop of the solution ordered into each eye, followed immediately by a medicine-dropper full of a saline solution. Collargol is often used, and saline or boracic solution is employed afterward. These substances must be dropped into the eyes from a new, clean medicine-dropper, and care must be taken that the excess fluid is carefully wiped away from the lids and face of the child. All preparations of silver stain the linen and also the skin, if they are allowed to remain and are exposed to light. The nurse should not take the responsibility of using these substances without written orders from the physician, and written directions as to the dose and method of employment.

Habits and Nerves.—Although the newborn infant does not appreciate many of the sensations which adults have, it begins very quickly to form habits and to manifest a nervous, irritable, or quiet disposition. Very much of this depends upon the care of the nurse and the regularity with which she performs her duties. The child's habits are begun from the first day of its life. If the nurse is methodical, patient, and kindly, by the end of a week or ten days the child will form regular habits of eating, of sleeping, and of other functions of the body which are the basis of good health and physical happi-

ness. When a child cries and frets it should be ascertained whether it is hungry, whether the diaper requires changing, whether the child is too warm or too cold, or whether something about the clothing is irritating it. If none of these causes is present, then the child will usually cease its crying if no attention is paid to it. Within a very few days after its birth, however, the infant learns that it can be taken up and obtain what it wants by making a disturbance and annoyance, and unless this is proved to be incorrect the child will soon have its parents and the nurse at its mercy. While children should never be neglected, and while the mother and the child should have the pleasure of being together as much as is consistent with the health of both, still discipline should begin at the same time that the care of the child first commences.

The First Discharges from the Bladder and Bowels.—Within twenty-four hours after birth, the infant should pass urine and meconium. The latter resembles burnt molasses, and gradually gives place to yellow feces. The first urine is brick red and scanty. Should these discharges be absent, the physician should be informed.

CHAPTER VIII.

THE ACCIDENTS OF PREGNANCY.

The pregnant woman is exposed to very grave dangers through convulsions, syncope, and hemorrhage, which may happen from several sources. We shall discuss first that which is most common, namely, abortion.

By **abortion** is meant the expulsion of the ovum before it has grown to the stage of viability; that is,

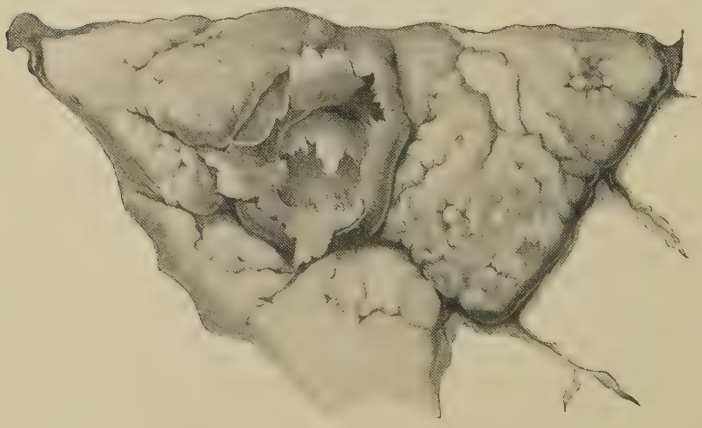


Fig. 20.—Ovum embedded in blood-clot (Ahlfeld).

practically before seven months. The symptoms of abortion are pain and hemorrhage. Bleeding may be so severe as to weaken the mother greatly, while if a part of the ovum be retained and decomposes she may suffer

from septic infection. It is especially important in cases of abortion that the patient be guarded from excessive bleeding, and that she be protected from septic infection.

Rest.—The duties of a nurse consist in putting the patient at absolute rest in bed, not allowing her to assume the sitting posture for any purpose whatever, in removing all disturbing influences from her, in keeping her absolutely clean and causing her to wear sterile vulvar dressings, and in saving for inspection all blood-clots or pieces of embryo. The physician will often prescribe sedative medicines to control the pain and to prevent the expulsion of the ovum. Opium is often used, and the nurse must watch for the characteristic effects of this drug.

Asepsis.—The vulvar dressings should be sterilized by baking or boiling, and the external parts should be thoroughly washed with soap and water, irrigated thoroughly, and then washed with bichlorid solution of such strength as the doctor may order, or with some other antiseptic solution. The hair on the external genital organs should be shaved or cut close. The nurse's hands should be made aseptic before the dressings are changed. Blood-clots and débris may be placed in cold water in a white vessel, when they can be examined most readily. The diet of the patient is usually liquid or light. It is often necessary to move the bowels by enemas.

It may be necessary to apply local treatment in cases of abortion. The nurse must have in readiness an abundance of hot water, antiseptic solutions, clean linen, and in some cases an anesthetic must be given. If the patient is to be catheterized, the catheter must be boiled before it is used, and the nurse's hands and the patient's external parts should be made thoroughly aseptic.

Consequences of Abortion.—Nurses must remember to

warn patients that an abortion is quite as serious as birth at full term, and that recovery occurs more rapidly from a full-term labor than from an abortion. If a patient neglects the instructions of her physician, and does not make a good recovery after abortion, she is exposed to chronic inflammation of the womb or some displacement which may make her an invalid for many years.

Bleeding.—If a nurse were alone with a patient who was having an abortion, and bleeding became so severe as to threaten the patient's safety before the doctor could arrive, the nurse would be justified in lowering the patient's head and in giving a vaginal injection of sterile water at a temperature of 115° to 120° F. Stimulants may be given in small doses only.

Bleeding may occur within the womb during the later months of pregnancy from injury or separation of the placenta. But little blood may escape. Bleeding may also occur when the placenta is at or near the mouth of the womb and in a dangerous and unnatural location. In such a case there would be a free flow of blood from the vagina. The question of diagnosis does not rest with the nurse; but she must remember that pregnant women may be seized with signs of weakness which, she has been taught, indicate bleeding, either internal or external. When such symptoms are present the patient should be put at absolute rest in bed and the doctor summoned as speedily as possible. The nurse will find the patient's pulse rapid and feeble, her color pallid, her skin relaxed and clammy, a desire for more air or for water, and dimness of vision present. If possible, the nurse should have in readiness hot sterile water, and an abundance of clean linen by the time the doctor arrives. If there is an antiseptic in the house, it

must be in readiness for his use. Whiskey or brandy and ice should also be ready. The nurse must expect that some form of obstetric operation will be done, and should be prepared for this if possible.

Another very dangerous form of hemorrhage is that which occurs when the ovum remains outside the womb, and when the sac containing the ovum or the tissue surrounding the ovum suddenly bursts. This bleeding is internal, and follows sharp pain in the abdomen. There are rapid pulse, pallor, and clammy skin, and unconsciousness with great faintness is also present. It is the nurse's duty to recognize the gravity of the symptoms, and to insist upon medical aid as soon as possible. Meanwhile she should prepare for a surgical operation as well as she can.

Enlarged Veins.—The veins of the lower extremities often become considerably enlarged during pregnancy. Should such a patient bruise her limbs a vein might rupture and serious bleeding follow. Should the nurse be present at such a case before the doctor could arrive, she should place the patient on her back, elevate the limb from which the bleeding is coming, and apply over the point of bleeding a perfectly clean compress several inches square. This may be held by the hand until the doctor arrives. If the limb be bandaged, the bandage must begin at the toes and encircle the entire limb from the toes to the groin. The nurse must be careful to have an absolutely clean compress, as septic infection might follow the use of soiled material.

Before rupture, however, the vein should be supported by the use of flannel or Jaeger woolen bandages. These are more comfortable than silk or silk and rubber, are readily washed, and easily applied. They should be cut

from loose flannel three inches wide. To apply such a bandage the patient should lie upon her back and the limb should be elevated to a moderate degree. The bandage should begin at the toes and cover the lower extremity completely, omitting, of course, the heel. The bandage should extend beyond the point where the veins are enlarged; and if there is a tendency to swelling in the entire limb, the bandage should extend nearly to the groin. The bandage may be removed at night when the patient retires, and the limb bathed and the skin kept as clean as possible. In some cases obstinate itching accompanies this condition, which is greatly relieved by bathing with warm water and sodium bicarbonate, or by using some lotion which the attending physician may prescribe (Fig. 21).

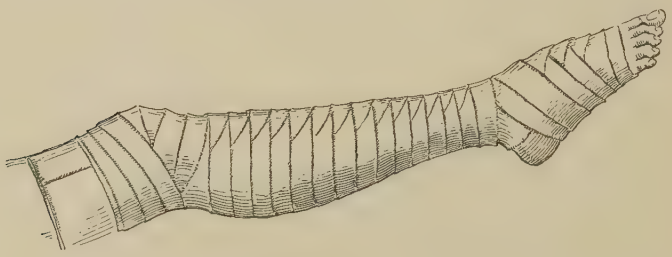


FIG. 21.—Spiral reversed bandage of the lower extremity.

Rupture of Membranes.—The membranes may rupture prematurely during the latter part of pregnancy, occasioning fright and distress to the patient. Those pregnant for the first time should be warned regarding the amniotic liquid, as otherwise considerable alarm will be occasioned. In some instances the patient wakes in bed to find her clothing and the bed very much soiled. In other cases the discharge occurs when she is in the erect posture or upon slight exertion. In some cases the amount of amniotic fluid is very large, so that the

patient may discharge from two quarts to a gallon of fluid.

The discharge of amniotic liquid usually means that labor is about to begin. It may indicate the presence of complications with either the mother or the child; hence the physician should be informed promptly when amniotic liquid escapes. In reporting this and other occurrences, if the nurse cannot telephone to the physician personally, she should write a note stating as accurately as possible what has happened. This will enable her to avoid unnecessary alarm to the family and will greatly aid the physician.

When amniotic liquid escapes the nurse should have the patient empty the bladder if possible, and should then wash the external parts thoroughly and make them antiseptic with an antiseptic solution. A sterile vulvar dressing should be applied with a T-bandage, and the patient should be put to bed until the doctor arrives. The nurse should comfort the patient by stating that this is not a dangerous occurrence, and that it does not necessarily mean harm to her child. It does not always mean a premature birth, for in some cases the amniotic liquid forms again and the patient goes on to the usual termination of pregnancy.

Convulsions (**Eclampsia**).—A pregnant woman may be suddenly seized with convulsions. These usually resemble very closely epileptic fits. The patient becomes suddenly unconscious, moves the limbs violently, froths at the mouth, becomes blue in the face and neck, and after a few moments slowly regains consciousness. Occasionally convulsions begin with acute mania. The patient becomes violent, and may attack a friend or relative.

In the presence of convulsions medical help must be

summoned at once. The nurse should try to open the patient's jaws and get between the back teeth a pad composed of a folded napkin or towel. This will prevent the patient from seriously wounding the tongue. The patient should be put to bed and undressed as soon as possible, and the nurse should prepare for an obstetric operation or a labor. An abundance of hot water, clean linen, stimulants, a syringe for injections into the bowels and a syringe for vaginal injections, blankets, rubber sheets, and several clean pitchers should be placed in readiness. Upon his arrival the physician may give medicine by hypodermic injection or in the rectum, may desire to give the patient a hot bath or hot pack, or may perform an operation. Should the convulsions return before the doctor arrives, the nurse should keep the patient upon the bed and keep the jaws asunder by the pad which we have just described. If the jaws are so firmly closed that they cannot be opened by the finger covered by a towel, the nurse may try to introduce some smooth and blunt object between the teeth. Such would be a clothes-pin, or a heavy ivory paper-cutter, very blunt and wrapped in a towel or napkin. No more serious complication for mother and child can arise than convulsions, and the nurse is justified in insisting upon the immediate presence of a physician.

Syncope.—Pregnant patients sometimes have attacks of syncope which are alarming, but which are not often dangerous. They result from fatigue, from being in a hot and close room, or from exposure to the heat of the sun, or from some sudden fright or shock. If the nurse is called upon to take charge of such a case, she should make the patient lie down with her head as low as possible, loosen her clothing, give her plenty of fresh air and a little stimulus. A teaspoonful of whiskey or brandy in

a little hot or cold water, or a teaspoonful of aromatic spirits of ammonia in water, is usually sufficient. The patient should lie quietly until she has completely recovered, when she may be taken to her home in some suitable conveyance. A nurse of experience will readily detect the difference between convulsions and syncope—the one a terrifying and dangerous complication, and the other not often indicative of great danger.

CHAPTER IX.

THE ACCIDENTS OF LABOR.

HEMORRHAGE DURING AND AFTER LABOR.

During labor the mother may bleed from disease of or accident to the placenta, or from a very extensive laceration. Should bleeding occur during labor, all that the nurse can do will be to send at once for the physician if he be not present, to have ready a copious supply of hot water, and to give the patient not more than a teaspoonful of whiskey or brandy every hour.

After the child is born the nurse should watch the patient for signs of bleeding, and if she sees the mother suddenly becoming pale she should at once place her hand upon the abdomen and try to outline the uterus. It should be a hard mass reaching to the umbilicus. If the abdomen feels like a pan of dough, and if blood is coming from the vagina, the physician must at once be informed, and must take steps to secure the prompt expulsion of the placenta. In such a case as this a hot vaginal douche will be necessary, and in some patients a hot intra-uterine douche as well.

After the placenta has been expelled the doctor will usually satisfy himself that the womb is well contracted. Should he not do so, the nurse should watch the patient as carefully as possible, placing her hand upon the uterus at frequent intervals and watching closely for the general signs of bleeding. When the nurse is told to clean and dress the patient, if the flow is very bright in color

and is excessive, she must at once inform the physician. Should bleeding come on very soon after the birth of the child, the physician is usually present, and will assume the active part in the treatment of the case.

Physicians differ greatly in their care of women in confinement. Those who are cautious will not leave the patient's house for at least one hour after the birth of the child. Others do not think this necessary, but leave so soon as they find that the uterus contracts, and that there is no laceration which requires closing. This throws an increased burden upon the obstetric nurse, as bleeding may come on at any time immediately after labor. If a physician wishes to help a nurse in these cases, he will remain by the bedside of the patient, watching the contraction of the uterus and her general condition, until the nurse has had time to remove soiled linen and dressings from the room, to make the patient absolutely clean and comfortable, and to wash and dress the child. It is a great help to obstetric nurses when a physician takes these precautions.

Post-partum bleeding usually occurs within the first three or four hours after the birth of the child. The patient becomes pale, feels like fainting, complains that the room is dark, that she is thirsty, is restless, and may have slight pain in the abdomen. Blood may flow very freely from the vagina; or but very little blood may escape because a clot forms in the neck of the womb, like a cork in the neck of a bottle, and holds back the blood. The abdomen feels like a mass of dough, the womb cannot be distinctly felt, the patient's pulse is from 100 to 120 or 130. The condition is one of great danger, and the nurse must immediately send for the doctor, and act at once.

What the Nurse Must Do.—The nurse should do these things in the order given: First. Rub the abdomen from above downward until she can feel the uterus. Then grasp it firmly by carrying the fingers behind the womb as deeply as possible into the pelvis, and, placing the thumb firmly upon the anterior surface of the womb, the womb should be bent forward over the pubic bone and brought as closely against the pubic bone as possible. Second. The nurse should have anyone who can help her bring the douche-pan or bed-pan in use, a fountain-syringe, and three or four toilet pitchers of water at a temperature of 115° to 120° F. Without removing her hand from the uterus, with the other hand she should introduce the douche-nozzle into the vagina, having first thoroughly soaked the douche-nozzle in the hot water, and, having her helper hold the douche-bag and pour in the water, she should give a hot vaginal douche of one gallon. She should rub the uterus gently while giving the douche, and continue to carry it downward and forward. Third. If the patient can swallow, the nurse should give her by the mouth two teaspoonfuls of fluid extract of ergot.

While she is doing these things a messenger should go for the doctor as rapidly as possible. Meanwhile the nurse must not become frightened or alarm her patient. Whoever helps the nurse will usually appreciate that something is wrong, but the patient if possible should not become alarmed. In most cases what we have described stops the bleeding or makes it much less. If the patient is greatly prostrated, the bed should be drawn out from the wall, and the foot of the bed raised until the head and shoulders are very much lower than the patient's hips. It is perfectly useless to raise the foot of a bed six or eight inches and expect benefit from it.

Very few beds found in private houses can be raised sufficiently to accomplish good.

If the doctor does not come promptly, the nurse should continue to grasp and massage the uterus gently; and, should bleeding return, she may repeat the hot vaginal douche. The pillow should be removed from beneath the patient's head. She cannot leave the patient because she must control the contraction of the uterus. If help does not come for one hour after the giving of the first dose of ergot, she may give one drachm in addition.

If at the end of an hour the doctor does not arrive, and the uterus shows a tendency to relax and to bleed, if the nurse has with her a hypodermic syringe she may give an injection of strychnin ($\frac{2}{30}$ or $\frac{1}{15}$ grain). The patient may also have one teaspoonful of brandy in hot water, and the brandy may be repeated in one-half hour. The patient must be kept absolutely still. Her bed may be wet and soiled, but she must endure this discomfort rather than have bleeding set up by moving her. Blankets should be wrapped about her legs, a hot-water bag covered by a piece of flannel, or a towel should be placed under the back of the neck at the base of the brain, her head should be as low as possible, and she should be encouraged to believe that in a short time she will be comfortable and well. We can scarcely imagine a case in which, within three or four hours from the beginning of bleeding, a physician could not be found to assume the responsibility. Usually, in the hands of good nurses, the physician who comes to a case of post-partum bleeding arrives to find the hemorrhage stopped by the prompt and skilful action of the nurse.

To Prevent Return of Bleeding.—When the hemorrhage is checked the doctor will take precautions to prevent its recurrence. Among others he may ask the

nurse to apply some form of binder especially adapted to hold the womb in contraction. A box binder is made as follows: Three large towels are rolled firmly and the rolls pinned or stitched. The uterus is made as small as possible by massage, and is carried down against the pubic bone. . One towel is placed across the abdomen above the uterus, and one towel is placed upon each side of the uterus, so that the womb is put in a box, one side of which is the pubic bone, the other three sides being the three towels. The abdominal binder is then pinned over the womb and these towels, beginning from above and pinning downward. This holds the womb firmly, while the pressure upon the abdomen is of benefit to the patient in a general way. Some physicians prefer a large pad placed upon the womb underneath the binder. The nurse is sometimes ordered to bandage the patient's limbs after hemorrhage.

Transfusion.—In some cases the physician performs transfusion of normal salt solution, introducing it beneath the skin or injecting it directly into a vein. The nurse should understand the preparation of normal salt solution for this and other purposes. It is not necessary to make the solution chemically exact, and in an emergency one teaspoonful of salt to a pint of water may be employed. Some physicians prefer one teaspoonful of table-salt and one teaspoonful of pure sodium bicarbonate to a quart of warm water. If the solution be prepared at a temperature of 110° F., before it can reach the interior of the body it will usually fall to 105° or 100° F. The nurse must take care that vessels in which this fluid is placed have been thoroughly scalded, and that the water has been thoroughly boiled before it is introduced into the body.

Tamponade.—Physicians sometimes introduce antiseptic gauze within the womb to prevent the return of

hemorrhage. For this the nurse should place the patient across the bed, her hips at the edge of the bed, her feet and legs on chairs. The patient should be moved as gently as possible. The physician will require an antiseptic solution, a perfectly clean or sterile towel, and materials for cleaning and making antiseptic his hands, while the few instruments required should be boiled before they are used.

Convalescence.—A patient who has had severe bleeding recovers slowly from her confinement. If she becomes infected, she is usually very ill. During her recovery she will require very careful feeding and the best of nursing to bring her back to good health. After severe bleeding sudden excitement and all disturbance of the patient must be avoided. She must not sit up suddenly, nor rise up quickly in bed, lest a serious accident to the heart or brain should occur.

PROLAPSE OF THE UMBILICAL CORD.

Occasionally during labor the umbilical cord emerges or prolapses from the womb. It is seen in the vagina, and if the accident has happened but recently, the cord still beats or pulsates. The accident is dangerous for the child because the cord may be pressed upon, thus shutting off the circulation of blood in the placenta, depriving the child of oxygen, and producing its death by asphyxia.

Should this occur when a patient is without a physician in charge, or a nurse alone, the nurse should send for the doctor as soon as possible; she should put the patient in bed if she is not already there, cause her to turn upon her left side with her thighs flexed, and urge her to refrain from straining and bearing down. Having made her

hands aseptic, the nurse should then take the cord in her fingers and gently carry it within the vagina. A vulvar dressing should then be placed and retained in position by a T-bandage. In this way the cord will be kept within the mother's body.

If the nurse does not succeed in keeping the cord within the mother's body, the cord which is prolapsed should be wrapped in a sterile towel, wrung out of sterile warm water. The cord should be kept warm and moist until the physician arrives.

A nurse can sometimes succeed in getting the cord retained if she places the mother in the knee-chest posture, then, replacing the cord within the vagina and drawing back the perineum, the cord will sometimes pass upward into the womb.

The nurse must be very gentle in her manipulations, for she can easily do considerable harm.

ASPHYXIA OF THE CHILD.

When the child is born it usually breathes and cries within a few moments after the umbilical cord ceases to beat. If the cord is not beating when the child is born, the child must breathe and cry if the action of its heart is to continue. When breathing does not commence help must be given at once. This must be done by the physician, and a nurse cannot be expected to assume this responsibility. The physician will require in the treatment of such a case hot and cold water, several pieces of soft, clean old linen, whiskey or brandy, a large basin or baby's bath-tub, and several soft, small woollen blankets or shawls. The treatment consists in performing artificial respiration, in stimulating the action of the heart and the lungs by placing the child in a hot bath (temp. 100° F).

and sprinkling or spraying its chest with cold water, and by using stimulants by dipping the finger in whiskey or brandy and inserting it into the child's mouth, to stimulate the movement of breathing.

Cleansing the Mouth.—It is especially important that the child's mouth be cleansed before the effort is made to induce breathing. The infant should be firmly grasped by both legs and held with the head downward. Placing one hand upon the forehead and raising the head gently, the mouth should be thoroughly wiped out with the other hand with a small bit of soft old linen dipped in boiled and sterile water. The child must be kept suspended by the legs for several minutes until mucus has had a chance to come out of its mouth.

Artificial Breathing.—There are several methods of making artificial breathing suitable for a child. We shall describe only the simplest which we think a nurse would be justified in employing. Some methods should be carried out by physicians only.

The child should be grasped by the two hands, one hand placed across its back at the shoulder-blades, the fingers coming upon the anterior surface of the chest. The other hand grasps the body by the thighs and pelvis. The child should be held with the hips considerably higher than the head. It should then be folded and unfolded, bending the trunk of the body forward very gently but firmly until the abdomen is distinctly squeezed and forced up against the chest. Then the body is unfolded or unbent until the child is bent slightly backward (Figs. 22, 23, 24). This should be done at regular intervals, counting one, two, three, four, between the movements. After making six of these movements the nurse should pause a moment to see whether breathing does not begin.

FIG. 22.—Grasping the child to perform artificial respiration.

FIG. 23.—Folding the child to cause expiration.

The constant tendency must be to keep the child's head low and its hips high, so that blood may be kept in the brain and mucus may find its way out of the mouth.

Stimulation.—If the child begins to make movements of respiration, it should be placed in a warm bath and its body gently rubbed until the skin becomes thoroughly red. If breathing continues, the child may then be taken from the bath, quickly dried, wrapped in warm blankets, and turned upon its right side. Ten drops of whiskey or brandy in a teaspoonful of hot water may be introduced into the mouth with a medicine-dropper as far back as possible. A method of producing breathing often used in adults may be employed with children. This consists in placing the child upon its back, and a small roll made of a sheet or blanket underneath the shoulders, so that the head drops slightly backward. The nurse stands at the child's head, and taking both arms draws them upward and outward as far as she can. The arms are then brought downward, inward, and forward in such a manner that the chest of the child is compressed, the arms being folded across the chest. It is well to have the mouth kept open slightly, and if possible the tongue drawn forward. These motions should be repeated, counting four between each motion.

Favorable and Unfavorable Signs.—So long as the child remains red in color there is good hope that it will live. When, however, it is pale and bluish, its limbs making no resistance to movement, it is in great danger of death. If the finger-tips be placed over the heart and the child's body bent forward, the heart can usually be felt to beat if life still continues. So long as the child is red or reddish in color we must not give up hope nor discontinue efforts to bring about breathing.

FIG. 24.—Unfolding the child to cause inspiration.

CHAPTER X.

OBSTETRIC SURGERY.

Obstetric operations are performed to save the lives of mother and child; or if the life of the child cannot be saved, to rescue the mother if possible. No surgeon but the obstetric surgeon has the responsibility of two lives in one operation. The most serious complication may arise almost without warning during an obstetric operation. Hemorrhage and septic infection must be avoided as in other surgical procedures. It is evident that the obstetrician and the obstetric nurse must be as careful, prompt, and diligent in the performance of their duties as are those who practise other branches of major surgery.

In Private Houses.—As many of these operations are done in private houses, the obstetric nurse must prepare from the furniture of the private house a suitable operating-table or bed, and other appliances furnished by hospitals. The low, very wide bed commonly found in private houses is exceedingly objectionable for obstetric operations. Neither doctor nor nurse can work to advantage with the patient upon such a bed. If a narrow, high bed cannot be procured, it is much better to use a table the size and shape of the ordinary kitchen-table. This should be clean, and covered with a blanket, rubber sheet, and clean linen; and after the patient has been anesthetized in her bed she may be lifted on to the table. Should the obstetrician desire the Trendelenburg posture, it may be obtained by raising the foot of the table in any convenient way, or by taking a large rocking-chair.

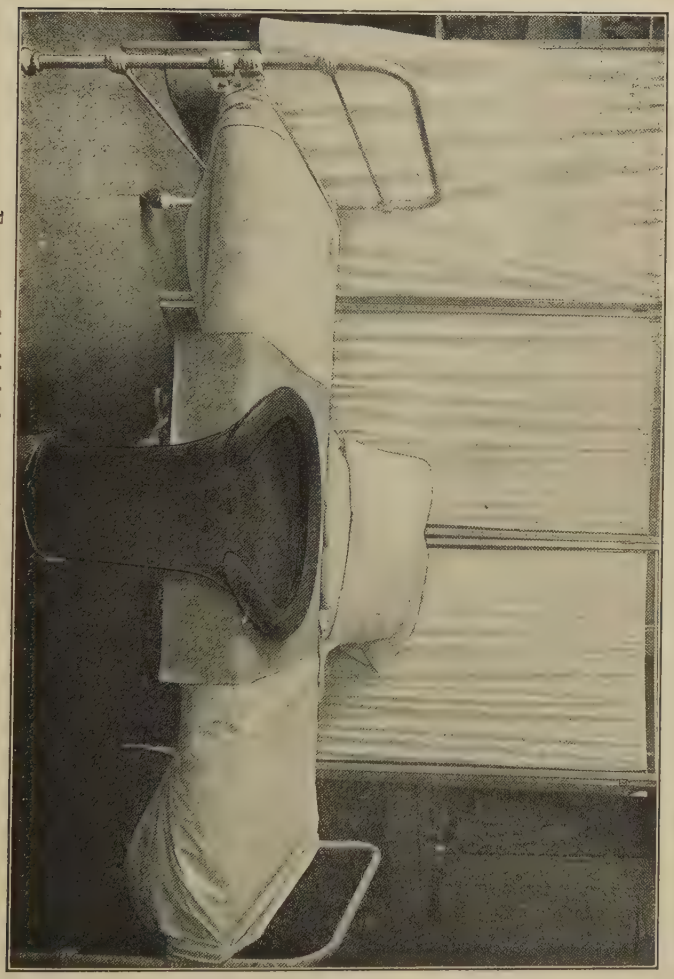


FIG. 25.—Suitable bed prepared for an obstetric operation.

removing the legs, and placing the chair with the seat and tip of the back upon a table. This forms an inclined plane, the patient's legs hanging over the under surface of the chair seat, while her body rests upon the back of the chair, suitably covered with blankets and rubber sheeting.

In addition to an operating-table, small tables are useful, upon which sterilizers, basins, and dressings may be placed. Tables used for cutting out clothing are very useful for this purpose. If suitable tables cannot be obtained, kitchen chairs having a large, firm wooden bottom will be found convenient. The nurse should avoid in obstetric operations damage to the patient's furniture. If instruments be sterilized upon a highly polished table, the varnish of the table will often be ruined. Antiseptic solutions may be spilled or may spatter upon finely polished furniture, injuring the polish. It is always much better to use the kitchen furniture if it is reasonably clean. Carpets are in danger of injury from the same cause, and the floor beneath the edge of the bed must be protected by rubber sheeting or by thick layers of paper, or by an old thick rug or any other convenient material, covered by sterile sheets or sheets wrung out of bichlorid of mercury solution, 1 : 2000.

Sterilizing Utensils.—Domestic utensils must often be employed for obstetric operations. China basins from toilet sets should be prepared by thorough scrubbing with soap and hot water, rinsing, and then scrubbing with bichlorid solution (1 : 1000). Toilet pitchers for sterile water should be prepared in the same way. Water may be sterilized by boiling in tea-kettles or in any other suitable vessel which is clean. To measure antiseptic

solutions, domestic quart measures must often be employed, and these must be made as sterile as possible.

Clothing.—In obstetric hospitals, sterile clothing is prepared for the lower extremities of the patient during an operation. This is not always used in private houses, but

FIG. 26.—Sterilized leggings and sheet for covering limbs and abdomen.

the lower limbs are covered with long stockings, and the thighs may be wrapped in sterile sheets or in large sterile towels (Fig. 26). Sterile pillow or bolster covers may be utilized.

Light.—To secure an abundance of light for an obstetric operation in a private house is not always an easy matter. A candle in a firm candlestick should be in readiness if light fails, as the obstetrician will often utilize the candle for the examination of lacerations or to insert stitches.

Preparation of Patient.—To prepare a patient for an obstetric operation, the nurse should ask the physician what method of preparation he desires, and whether he wishes the nurse to catheterize the patient. If he gives no definite instructions, and if he tells the nurse to catheterize the patient, she may proceed, we think, properly as follows: The external parts, including the hair above the pubes, should be very thoroughly washed with soap

FIG. 27.—Glass female catheter.

and warm water. The hair should be trimmed short with scissors curved upon the flat or removed by shaving. The parts should be very thoroughly rinsed with hot water; and if the patient's bowels have not been emptied by enema the rectum should be very thoroughly washed out with hot soapsuds. Then the parts should be scrubbed with cotton or gauze dipped in bichlorid solution (1 : 2000). Having sterilized the catheter by boiling, and having very carefully scrubbed and made antiseptic her hands, the nurse should then catheterize the patient. After this the tissues about the meatus should be again thoroughly douched with the bichlorid solution.

The physician should specify whether he desires a

vaginal douche given; and if so, what the douche should be. Many physicians prefer lysol in 1 per cent. solution, because it does not injure the lining membrane of the genital tract, but leaves it in a favorable condition for the passage of the fetal head. No douches should be given without the doctor's order.

Anesthesia.—The anesthetic for an obstetric operation should be administered by a physician with the same precautions used in any other surgical procedure. The difficult extraction of the child is as serious an operation as the removal of an ovarian tumor. Hence the same precautions in the care of the patient should

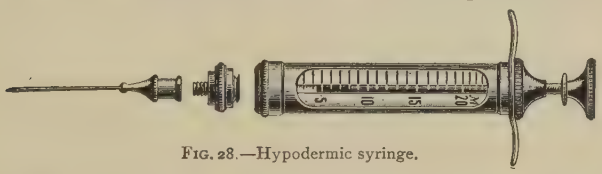


FIG. 28.—Hypodermic syringe.

be taken. No nurse should undertake the responsibility of giving an anesthetic for an obstetric operation. If the physician first anesthetizes the patient and then tells the nurse to continue the anesthesia, she may do so upon his responsibility. The anesthetizer should have a hypodermic syringe with tablets of strychnin, atropin, and other stimulants, whiskey or brandy, should be in readiness, several small soft towels and a small basin should the patient vomit. Considerable suffering may be avoided if the nurse rubs upon the patient's lips and about her nostrils a little cold cream or vaselin before the anesthetic is administered.

Anesthesia by the Nurse.—If it can possibly be avoided, the nurse should not undertake the responsibility of giving anesthetics to surgical anesthesia for a consider-

able time. This procedure requires the training and experience of a physician, and very serious consequences may follow the ignorant or careless giving of anesthetics.

Occasionally in obstetric operations where no other help can be obtained, the nurse must give the anesthetic under the doctor's supervision. In these cases the doctor will first administer the anesthetic until the patient is practically under its influence. He will then give the cone or inhaler to the nurse, instructing her whether she is to put it directly over the patient's mouth, or whether it is to be held at some distance from the face. If ether is used, the cone, or gauze, or inhaler, may be held much closer to the patient than if chloroform is given. A larger quantity of ether than of chloroform can be taken. If chloroform be administered, the cone or inhaler should not be used by the nurse, but a piece of gauze or a clean handkerchief or napkin should be taken instead. This should be held about two inches from the patient's nostrils, allowing air to enter the nose and mouth freely. A few drops of chloroform at a time should be dropped upon the gauze or handkerchief, and no large amount of chloroform should be poured from the bottle at any one time. Patients often breathe more quietly with chloroform than with ether, but sometimes cases of heart failure occur under chloroform, which develop suddenly and to an alarming extent. When the nurse is giving chloroform, she should watch carefully the patient's color, and, if possible, observe the condition of the pulse.

When ether is given, the patient's mouth and nostrils should be anointed with a clean ointment to prevent the irritating effects of the anesthetic. If gauze is used it may be laid over the mouth and nostrils in several

layers, and the ether dropped almost continuously upon the gauze.

During anesthesia the patient's tongue may drop back into the throat, covering the entrance to the windpipe or trachea and lungs. This will prevent respiration, and unless it be remedied, the patient may die. In these cases the jaws very frequently become set, the tongue may be pinched or bitten, and it is very difficult to open the mouth.

To prevent this during anesthesia the nurse should place the thumbs deeply under the angle of the jaw. The jaws should then be raised and drawn forward, when the base of the tongue will be raised, and air will gain access through the trachea. If this does not succeed the mouth must be opened as quickly as possible, the tip of the tongue seized, and the tongue drawn strongly forward and downward.

During anesthesia the nurse should take the precaution to keep between the patient's teeth the end of a folded napkin or handkerchief to prevent the jaws from coming tightly together.

If at any time during anesthesia the patient's color becomes a whitish-blue, or the patient breathes badly, the physician must be immediately notified.

When the patient is recovering from the anesthesia she requires attention. Before she becomes conscious the tongue may drop back over the trachea, which would greatly interfere with her breathing.

If the patient vomits, a piece of food or a mass of mucus may get into the larynx and threaten suffocation. A firm clot of milk, or a piece of half-digested meat is especially dangerous. The patient should not be left

without care after anesthesia until she is quite conscious and fully able to free the mouth of any material which may collect there.

The nurse can do much for her patient in encouraging and comforting her, should an obstetric operation be necessary. Many women shrink from such because they fear that the operation will injure the child. The nurse should explain that the operation is undertaken in the interests of the child as well as the mother, and that it is far better for the child than to delay. In this way the nurse can give great assistance to the patient and to the physician as well. During obstetric operations no one should be present, if it can possibly be avoided, except physicians and nurses. Occasionally some self-possessed person may be useful as an assistant.

The nurse must have ready hot-water bags or hot-water bottles to secure a good reaction after the operation. It is much better to remove the patient from her bed for the operation, as she may then be placed upon clean, dry linen immediately after. If the family do not realize the fact, they must be told that she will not recover from the effects of the ether for a short time, and so their apprehension may be allayed.

Instruments.—The physician will bring with him his instruments and gloves and the sterilizer in which they are to be prepared. The most convenient and simple apparatus is a tray or pan covered by a second slightly larger than the first. Instruments can be boiled in such by the use of an alcohol lamp or by placing the pan upon a stove. Some physicians prefer to add a tablespoonful of sodium bicarbonate to the water in which their instruments are boiled, while others use a 1 per cent. solution of lysol.

Some employ carbolic acid in 1 or 2 per cent. solution. When the instruments have been boiled the upper pan or tray is removed, turned over, and placed beside the first. This gives the operator two sterile trays or pans in which he may arrange his instruments. Occasionally the nurse will find that a physician comes to an obstetric case without a sterilizer. Instruments must then be boiled in some domestic utensil, which is a very unsatisfactory procedure. Nurses must also exercise caution in the use of alcohol lamps, placing them on metal trays if possible, for we have known of distressing accidents from this source. The sterilizer and its lamps may be safely placed in an empty bath-tub, which is the most convenient method. The bath-room is usually the most available room for the nurse's preparations.

DELIVERY BY FORCEPS.

Instruments.—The obstetric forceps is an instrument composed of two parts resembling a pair of human hands and arms, applied to the head or body of the child to extract it from the mother. The two portions of the instrument are called blades, the left and the right. They are placed one above the other, crossing each other, and fastened together about the middle by a device called the lock. When a nurse is told to prepare the forceps for use it is meant that she should sterilize them. They should be kept in the solution in which they are sterilized until the physician applies them to the child. If they are not sterilized, the physician will sometimes order them placed in a toilet pitcher of antiseptic fluid, the larger portion downward and the upper part, or handles, above. The pitcher is covered with a clean

towel, and is placed upon the floor at the side of the physician. Cases in which it is necessary to deliver by forceps are often those in which a laceration of the

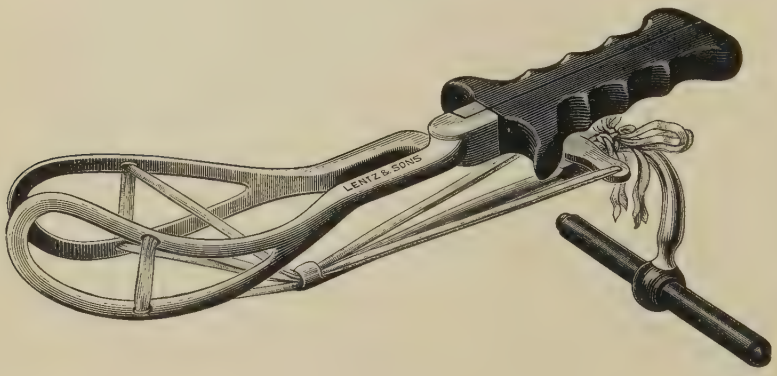


FIG. 29.—Davis's obstetric forceps.

mother's tissues is inevitable. Physicians usually prepare instruments for closing lacerations when they prepare

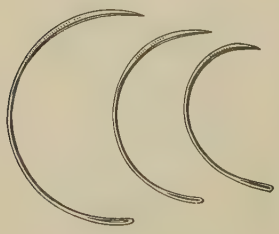


FIG. 30.—Kelly's cervix needles.

FIG. 31.—Cervix needles. *a*, Emmet's round point; *b*, Hanks' double edge, stout; *c*, *d*, Sims' concave point, straight and curved; *e*, Skene's trocar point.

the forceps. These are needles and needle-holder, hemostatic forceps, scissors, tenaculum forceps, and uterine dressing-forceps. As it may be necessary in these cases

to give a vaginal or intra-uterine douche, a douche-tube should be boiled with the other instruments. Some physicians prefer to sterilize a strip of gauze with the instru-

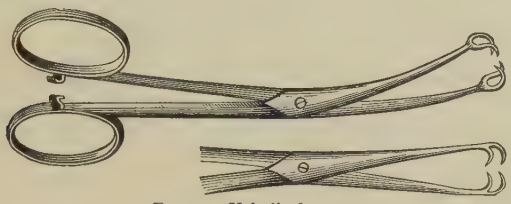


FIG. 32.—Volsella forceps.

ments, as such is occasionally required after the operation. In other cases the gauze is kept in the glass jar or bottle

FIG. 33.—Tenaculum forceps.

in which it is purchased, and is removed from the jar only at the moment when it is used. Suture material is

FIG. 34 —Davis's uterine dressing-forceps.

often sterilized with the instruments. If possible, instruments should be boiled for from twenty minutes to one-half hour.

Preparation of Patient.—For forceps operations the patient is usually placed upon her back at the edge of the bed or table. Beneath her should be a rubber sheet or Kelly pad (Fig. 35), and a slop-jar to receive douche-water and discharges. Occasionally the patient is turned upon the side, usually upon the left side. In

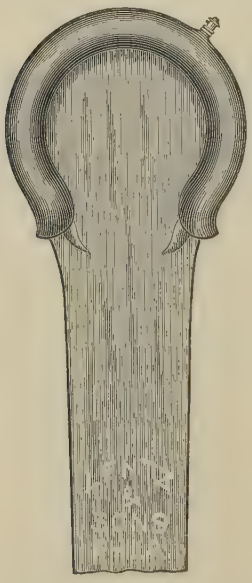


FIG. 35.—Kelly pad.

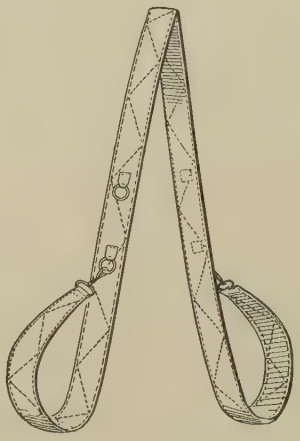


FIG. 36.—Robb's leg-holder. The leg-holder is made of unbleached canton flannel and can be washed (Ashton).

hospitals, where there is an abundance of assistants, each lower extremity may be held by a nurse. In private houses it is well to use some simple device which will support the limbs. Of these, the best is a sheet folded in the longest way, so as to make a band six or eight inches wide. When the patient is anesthetized and placed in position, her legs are flexed upon the thighs, and the thighs upon the body. The sheet is then placed across

FIG. 37.—Patient in position for forceps operation, limbs supported by sheet.

the patient's shoulders just below the neck, passed on the outer side of each lower extremity, and tied around the leg just below the knee. In this way the limbs are drawn backward and rotated outward. Assistants are not required to hold the limbs, and the posture is a convenient one for the operator. Over the limbs and abdomen sterile linen should be applied. Should the obstetrician prefer, he may employ Kelly's or Robb's leg-holder (Fig. 36), made for this purpose. After the patient has been placed in position, the limbs supported, the lower half of her body should be covered by a sterile forceps sheet. This consists of two large and long legs joined above by a square sheet large enough to cover the abdomen. This is drawn over the limbs and abdomen from below upward.

Nurse's Duties.—Beneath the edge of the bed or table should be placed some material to protect the carpet. The physician's forceps and other instruments in the sterilizing pans should be placed upon chairs or a table at his right hand, and a basin of antiseptic solution with gauze or cotton sponges should be in readiness. The nurse should prepare the antiseptic solution ordered for the douche, and also boil the catheter. The physician will usually order the nurse to prepare the patient for the application of forceps, and this is done as already described. During the actual delivery of the child the nurse can sometimes assist with the anesthetic or occasionally follow the doctor's orders in rubbing the uterus and causing it to contract. She should be ready so soon as the child's head is born to wipe out the eyes and to cleanse the mouth, as is done in normal cases. The child is often asphyxiated for a few moments after such a delivery, and then the nurse may assist in causing it to breathe. If possible, a clock or watch should be visible and the

FIG. 38.—Holding the patient in Walcher's position.

time of the child's birth should be noted. When the placenta has been delivered and saved for examination, a thorough vaginal douche is given as ordered by the doctor, ergot or strychnin is usually administered, and the physician proceeds to close any lacerations which may be present. During this portion of the operation the nurse may antisepticize her hands and put on sterile gloves and assist the physician by threading his needles and sometimes by sponging the parts. Should the physician decide to give an intra-uterine douche, the nurse must be careful that the fluid is of the exact composition ordered and of exactly the temperature desired. The douche-tube must not only have been sterilized, but should also be thoroughly rinsed with an antiseptic solution before introduction. The usual dressings are applied after the stitches have been taken.

Walcher's Position.—In cases of forceps extraction in which especial difficulty is experienced in causing the head to descend the physician may put the patient in Walcher's posture. The patient must be placed upon her sacrum just above the buttocks at the edge of a table sufficiently high so that her feet cannot reach to the floor. The lower extremities are then allowed to fall directly downward toward the floor. She must be held in this position by two assistants, one on each side, grasping the sides of the pelvis and preventing the patient from sliding off from the table. During the delivery with forceps especial care must be taken that the patient does not slip down too far. To protect the patient's back, the nurse must place upon the edge of the table a blanket firmly and smoothly folded, or a folded sheet covered if possible with some woollen material. The lower extremities must be covered with suitable leggings or wrapped in sheets or blankets pinned about the limbs with safety-pins. As the

delivery proceeds the physician may request that the thighs be flexed, thus altering the tension of the muscles upon the floor of the pelvis.

VERSION OR TURNING.

Sometimes it is necessary to turn the child in the womb and cause it to be born with the feet and legs first.

FIG. 39.—Version in breech presentation, first position; extended limbs; feet in the fundus of the uterus, bringing down the anterior and left foot with the left hand (Nagel).

For this operation obstetricians usually prepare the forceps and instruments just described, because the forceps may be used at the latter part of the extraction of the

child. The patient is prepared as already described, and is catheterized. She is placed upon her back with the limbs flexed. The physician may turn the child by external manipulation, but usually does so by introducing a part or all of one hand within the womb. He will require material for disinfecting his hands, and usually lysol or creolin is used, because it furnishes a lubricant as well. A slip-noose of gauze or a strip of sterile linen is sometimes employed after version has been completed, to hold the child's limb. If the physician orders it, the nurse should have it in readiness. After version has been completed the birth of the child proceeds slowly until the body has been expelled. As the body is expelled the nurse should have in readiness several warm towels, one of which the physician will wrap around the child's body to keep it from becoming chilled. When the head is to be born the patient is usually urged to bear down strongly and the body of the child is raised toward the mother's abdomen. Sometimes it is necessary to use forceps to bring out the head, and when this is the case the nurse may be told to grasp the body of the child wrapped in the towel, and raise it strongly over the mother's abdomen. The physician can then apply forceps underneath the body of the child. Laceration may occur during version and extraction, and the instruments already described will be needed for its repair.

SYMPHYSIOTOMY; PUBIOTOMY.

When the pelvis is too small or the child is a little too large the pubes may be severed to allow the child to escape. This operation is called symphysiotomy or pubiotomy.

The Operation.—The instruments required are a

scalpel, a fine saw, a probe-pointed bistoury, a sound, hemostatic forceps, needles and needle-holder, scissors,

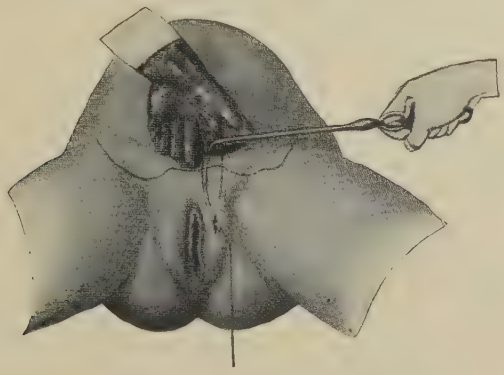


FIG. 40.—Pubiotomy by Döderlein's method (Costa, Annali di Ostetricia, No. 6, 1910).

uterine dressing-forceps, antiseptic gauze and a roll of surgeon's adhesive plaster, an abdominal binder, and often

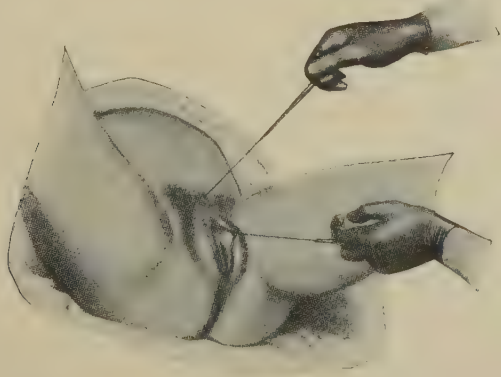


FIG. 41.—Pubiotomy performed by Bumm's method (Costa, Annali di Ostetricia, No. 6, 1910).

a catheter to which is attached a long piece of rubber tubing. These instruments must be sterilized and the

patient prepared as described. Several assistants are required. The patient is placed upon her back at or near the end of the table. The limbs are usually extended at first, but afterward flexed. After the opening of the pubes the delivery of the child is usually accomplished by the use of forceps. These should have been sterilized with the rest of the instruments and kept in readiness. Lacerations often occur, which are closed as usual. The wound made above the pubes must also be closed by suture.

The Dressing.—When the pubes is opened the two halves of the pelvis gape asunder. When the child is delivered these two portions must be brought together, and some apparatus is required to maintain them in that position. Various sorts of bandages and other restraining apparatus have been used. A good and simple dressing consists of a strip of surgeon's adhesive plaster, six to eight inches wide, long enough to go around the patient and to overlap. The pelvis of the patient is pressed together by two assistants, who grasp her body at the hips. An antiseptic dressing is placed over the wound. A strip of adhesive plaster from which the muslin has not been removed is carried underneath the patient, and is pulled tight and smooth by two persons holding the ends. The muslin strip is then hastily pulled off and the adhesive strip is brought up and around the patient in such a way that the center of the strip is directly over each trochanter of the femur. The strip is made to overlap. Over this is placed an abdominal binder. A catheter is often inserted into the bladder and allowed to remain.

The After-care.—After symphysiotomy or pubiotomy the patient must lie upon her back for at least two

weeks. Her bed must be kept very carefully, and attention paid to the skin to avoid bed-sores. It is often hard to make the patient realize that it is absolutely necessary that she remain upon her back. Such patients require the use of a catheter. When the patient is dressed, two strong persons stand upon each side, press firmly against the sides of the pelvis, the old strip of plaster is quickly removed, the skin bathed with soap and water and with alcohol, and a new strip is applied. This opportunity may be taken to apply alcohol or alcohol and water to the skin which is just beneath the plaster, and in this way soreness can usually be avoided. A patient who does well can usually turn upon her side at the end of three or four weeks. The plaster strips may be removed, and the patient can wear a canvas belt with straps and buckles. She is usually well in six weeks after operation.

Some employ a cot bed so arranged that the middle of the bed can be let down. It is very useful in treating cases of pubiotomy. By this means the discharges from the bowel and the bladder can be removed without disturbing the patient, and the patient can readily be kept clean. As the cot is made of strong canvas, and sags slightly, the pressure of the sides of the cot upon the sides of the patient's pelvis help to keep the two halves of the pubes together.

EMBRYOTOMY (CRANIOTOMY).

It is sometimes necessary to destroy the child or to dismember its body and to bring it away piecemeal. This is known as embryotomy. Because the head presents most frequently it is most often pierced by such operations, and hence the most frequent variety of embryotomy is craniotomy. If the child be living, some parents desire

that the rite of baptism be administered to it before the operation is done. As embryotomy is an operation shocking to the mother and to her friends, the nurse must take care that no description of the operation is

FIG. 42.—The head extracted by the cranioclast (Bumm).

given to the mother, and that the body of the child is kept out of sight. Curious persons may desire to examine it, and greatly exaggerated and distressing reports may arise from this source.

The patient is placed in the dorsal posture and anesthetized, the doctor's instruments and other appliances being in readiness. A plentiful supply of antiseptic solution for a douche must also be ready. The physician will extract the child by perforating the head, crushing it and delivering, or by opening the head and removing the brain. During the extraction of the child he will require a plentiful supply of hot antiseptic fluid, as it is often necessary to wash out the brain before the body is delivered. Lacerations often occur, and instruments and appliances must be in readiness for closing them. In some cases it is necessary to cut the body of the child into several pieces to deliver it. This is usually done by the employment of large, blunt-pointed scissors. Care should be taken that the body of the child is kept covered from the moment it is born. The strictest antiseptic precautions must be taken both before and after embryotomy, as many of these cases have been long in labor, and some of them are infected before they enter a hospital or before the operation is done.

DELIVERY BY ABDOMINAL SECTION (CESAREAN SECTION).

The Operation.—It is believed that Julius Cesar was extracted from his mother by abdominal incision, and hence delivery in this way has been commonly called Cesarean section. By this operation are meant the opening of the abdomen; the opening of the uterus; the extraction of the child, its placenta, cord, and membranes; and the closure of the uterus or in some cases the removal of the womb. The mother is exposed to dangers of hemorrhage and septic infection, while the child may be injured if the operation be not well performed. The

operation is done in cases in which the pelvis is so small that a living and viable child cannot be delivered through the usual channel. In some cases the presence of a tumor may make delivery by Cesarean section necessary. In most of these patients the mother is in a sound and aseptic condition before the operation is undertaken. Hence the operation is a good test of the asepsis of the operator and his assistants, for if infection follows it comes most probably through his carelessness or ignorance. In order that Cesarean section may be successful the operation must proceed absolutely smoothly. The child is born very quickly after the abdomen is opened, and should delay occur at this moment the life of the child may be lost and the mother may be brought into great danger. Hence those who assist in this operation must understand what is expected of them, and must do it carefully and promptly.

Preparation of Patient.—To prepare a patient for Cesarean section, she should be under observation for at least a week. The intestinal canal must be thoroughly emptied, and such medicine for this purpose as the doctor prescribes must be carefully given. The lower bowel should be emptied and cleansed by high injections of salines and glycerin, of normal salt solution, or any other preparation which may be ordered. The patient's skin must be made active by a daily warm bath. The diet should be limited to liquids or to very simple and easily digestible food, and an abundance of water should be taken. The physician in charge will examine, or cause to be examined, the patient's urine to know whether the kidneys are acting properly. If she has a cough, this must be reported to the physician, and any other abnormalities about the patient. The physician will decide by conferring with the patient and her friends as to the sort of

operation to which she will consent. It is better that the patient should be at rest during the greater part of the time. She can usually be made comfortable in bed, and this will avoid unnecessary fatigue. The nurse should encourage the patient in every way and tell her the good results obtained by this operation. In most cases in the hands of good operators mother and child recover. Attention must also be given to the breasts and nipples, because the mother can nurse her child after the operation in most cases. The breasts and nipples should be washed thoroughly with Castile soap and warm water, and the nipples anointed daily with sterile olive oil or an ointment which the physician may order.

Antiseptic Preparation.—The operator should give precise and in most cases written directions for the antiseptic preparation of the patient. Most operators order that the abdomen be thoroughly scrubbed with Castile soap and warm water and a soft brush, that the hair above the pubes be shaved and the hair about the labia be trimmed short with scissors curved upon the flat, and that the parts be douched thoroughly with boiled water, then scrubbed with alcohol and with bichlorid solution (1 : 2000). Others prefer the use of green soap and alcohol; and some employ a poultice of green soap, which is worn by the patient for eight or ten hours. Some operators prefer lysol or carbolic acid. After the abdomen has been prepared an antiseptic dressing is applied large enough to extend from the tip of the sternum to the pubes. This is bandaged upon the patient by a many-tailed bandage. Such preparation should be made at least twenty-four hours before the operation and the dressing worn during that time. Just before the commencement of the operation, and often while the patient is being anesthetized, the

abdomen may be prepared again in the same manner or as the obstetrician may direct. In some cases vaginal disinfection is also practised. This is done by a copious vaginal douche of tincture of green soap (two ounces to one pint of boiled water). The mucous membrane is thoroughly scrubbed with pieces of gauze or cotton held in uterine dressing-forceps. A copious douche of hot boiled water is then given, and after this a douche of bichlorid solution (1 : 2000). In some cases the operator applies a dressing of surgical gauze as well. A bichlorid napkin is worn over the vulva until the time of operation.

Many operators prefer to have the abdomen prepared as described twenty-four hours before the operation. Immediately before the incision is made the first dressing is removed and the abdomen thoroughly painted or rubbed with iodin in solution. Some prefer 2 per cent. watery solution; others use the tincture of iodin.

Preparations for Operation.—Whenever possible Cesarean section should be performed in the aseptic operating-room of a modern hospital. This, however, is often not possible, as many of these operations must be done in private houses. If an ordinary room must be used and there is time to prepare it, carpets and curtains should be taken away, and the floor and as much of the room as possible thoroughly scrubbed with soap and water. After this a thorough scrubbing with mercuric chlorid solution (1 : 500) should be practised. An operating-table may be improvised by using one or two kitchen tables which have been thoroughly scrubbed. Pitchers and basins or metal vessels to be used must be thoroughly cleansed by scrubbing with soap and boiling water, or preferably by boiling. Sheets, towels, and linen to be used must be sterilized by boiling for at least thirty minutes. A half-dozen large bottles or small jugs should

be fitted with tight corks, so that they may be filled with hot water and applied about the patient. Before the time of operation some reliable person must see that plenty of hot water is available. The room must also be heated, and an open stove or wood fire is the best heat available. If furnace heat is employed, the operating-table should be placed as far as possible from the furnace register, and over the register there should be tacked several layers of cheesecloth or bichlorid gauze to arrest the dust. Over the bottom window sash sheets or newspapers should be tacked if there is a possibility that anyone may look into the room. Several small tables or a number of chairs with flat, hard bottoms are needed in addition to the operating-table.

The Nurse.—The nurse must personally be sure that she is in an aseptic condition. She must not come to a Cesarean case from any contagious or infectious disorder. She should thoroughly cleanse herself by a daily bath for several days before the operation, and should have the hair thoroughly washed. Her clothing should be absolutely clean, the finger-nails trimmed smooth and short, and there should be upon the hands no sore spot or pimple containing pus or other suppurating surface. She should wear sterile gloves. She should not have a foul discharge from the nose or mouth or from any part of the body. If the case be done in a hospital, instruments, dressings, and ligatures will be sterilized in the hospital apparatus. If the operation be done in a private house, the nurse must choose perfectly clean vessels in which the instruments can be boiled and kept. Fortunately, she will rarely be obliged to do this, as the operator will usually bring with him apparatus for sterilizing.

The part which the nurse takes in this operation will depend considerably upon the number of assistants

present. The operator usually requires an assistant who helps him in the operation. Another physician gives the anesthetic. Another assistant receives the child at the moment of its birth, sees that it breathes properly, and ties and cuts the umbilical cord. An experienced and self-possessed nurse is perfectly competent to do this, and this part is often given to a good nurse. A nurse or physician should watch the needles and ligatures, keeping the needles threaded without interruption. The same assistant may help with the sponges if assistants are not abundant. It is better if possible to have one nurse or one physician give entire attention to sponges and dressings.

Receiving the Child.—Skilful operators can perform the operation in private houses with the assistance of two physicians and one nurse. To do this the operator must prepare his needles, sutures, ligatures, sponges, and dressings before the operation commences. The nurse must take the child and give it the first care which it requires. She prepares a shallow vessel covered by a warm blanket or sheet, and, standing at the operator's side as he directs, she holds the vessel in her arms. The operator, when the uterus is opened, removes the child quickly, with its placenta, cord, and membranes, and puts the entire mass into the vessel covered by the sheet. The nurse then ties the umbilical cord, cuts it, wipes the child's mouth and eyes, holds it head downward, and assists its respiration in the manner which we have described. Some operators hand the child to the nurse, and then tie and cut the cord themselves. After the child has been separated from the mother and has breathed, it should be turned upon its right side, wrapped in a warm blanket, and given to the care of some intelligent person, who

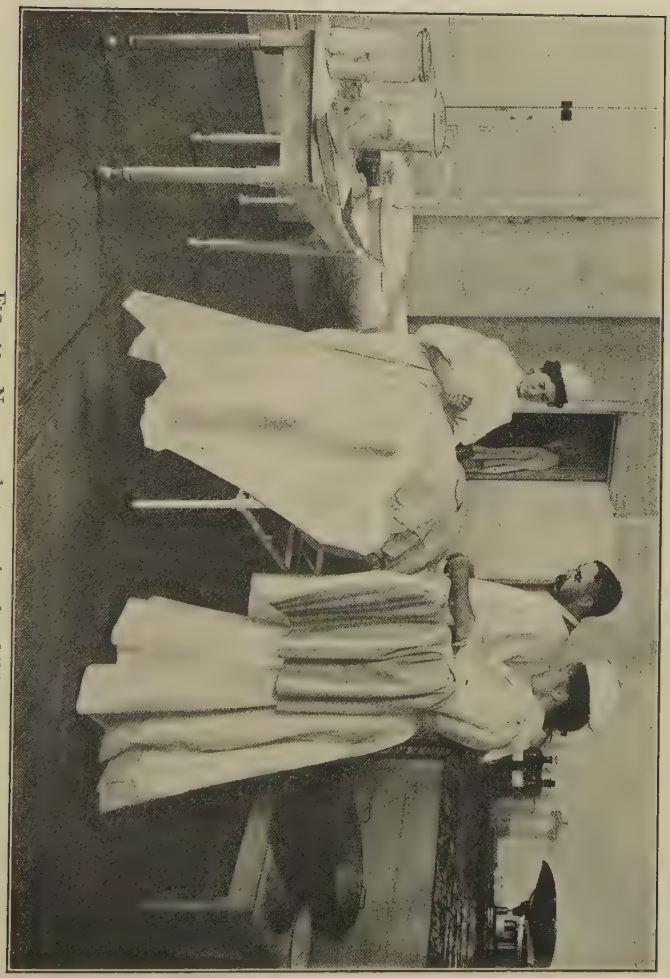


FIG. 43.—Nurse ready to receive the child.

will watch its breathing and notify the obstetrician if the child is not breathing well.

EXTRAPERITONEAL SECTION.

By this method of operating the abdomen is not opened in the median line, but an incision is made across the abdomen above the pubis, the peritoneum pushed up, and the uterus opened without opening the general peritoneal cavity.

By another method the incision is made along the groin above the edge of the pelvis, and the uterus is opened low down through this incision without opening the general peritoneal cavity.

Vaginal Cesarean Section.—By this operation the uterus is opened through the vagina before the cervix is dilated. A transverse incision is made across the cervix, and the urinary bladder pushed up out of the way. The cervix is then split lengthwise until the lower portion of the womb is opened, through which the child may be extracted. In this procedure the general peritoneal cavity is not opened. This operation is often done in cases of eclampsia.

Nurse's Duties.—The nurse's duties before the operation are to prepare the patient in the manner ordered by the obstetrician; to have on hand such supplies in the way of sterile dressings, linen, towels, and solutions as he may order; to see that the room is properly prepared and at the proper temperature; and to have ready a copious supply of hot water, stimulants, and such drugs and medicines as may have been prescribed by the doctor.

During the operation, if ordered to do so, the nurse may receive the child and care for it as directed. If this duty is given to another, she must assist with dressings, needles, sutures, and ligatures as desired, remembering to

observe strictly antiseptic precautions. Her hands and arms must have been made thoroughly aseptic before touching sponges, instruments, sutures, ligatures, and needles. If by accident during the operation she touches any article which is not aseptic, she must at once again cleanse her hands and arms. If placed in charge of sponges, she must know how many gauze pads and sponges she has, and be able to assert that all have been returned. Cases are on record where the patient has lost her life because a nurse did not know that a gauze pad or sponge had been left within the abdomen. She must also have knowledge of the number of needles and instruments employed.

After-care.—So soon as the operation is over it will be her duty to supply promptly hot bottles, blankets, clean linen, and stimulants. She must be ready to give rectal injections of stimulants if desired. She must obtain from the obstetrician written orders regarding the treatment of the patient, and she had better insist that orders be left in writing. She may plead that the responsibility is so great that she cannot honestly assume it without written orders. If she is required with the patient, she must not neglect the mother to clean the doctor's instruments. Nurses sometimes make grave mistakes in neglecting a patient to clean the doctor's instruments promptly and thus enable him to leave the case.

The after-care of a case of Cesarean section consists in the very careful following of the written orders given by the doctor. The nurse may be required to give rectal injections of stimulating or nutritious substances immediately after the operation. Hypodermic injections of sedative medicines are sometimes used. Nothing should be given by the mouth without the distinct order of the doctor, and liquid food is usually employed with these

patients for the first week or ten days. When the patient has reacted well from the operation and desires to see the child, it may be shown to her, and she may attempt to nurse it. If she does well, she should nurse the child afterward at regular intervals. It is usual to move the bowels thoroughly two or three days after the operation. The patient is given some purgative medicine in small doses, followed by salts, and then by an enema or by repeated enemas. Enemas of saline, glycerin, turpentine, and soapsuds are usually employed at first. Later, castor oil, olive oil with turpentine and soapsuds, or soapsuds only are usually given. It may be necessary to give this injection as high in the bowel as possible, using a long, soft rectal tube and inserting it very gently.

After-symptoms.—When the nurse is left alone with the patient she should watch carefully the condition of the pulse, taking the temperature at regular intervals as directed by the doctor. Should the pulse become rapid, or should the patient complain of pain in the abdomen, or should the abdomen become distended, the nurse must notify the physician at once. Patients may vomit for a while after the administration of ether. This should cease within a short time. Should the vomiting not cease the physician must be notified. For the first twenty-four hours after the operation the patient must remain absolutely still. The nurse must exercise the greatest watchfulness, and two nurses are needed to relieve each other. The child, fortunately, will not require much care, as it usually sleeps the greater part of the time. It must be put to the breast as ordered, and given water from a medicine-dropper or a teaspoon in addition.

Convalescence.—When the patient does well the stitches are removed at the end of ten days or two weeks; the patient is allowed light diet at about the

same period; she may turn freely upon her side at the end of the first week or ten days, and is able to sit up in bed at the end of two or three weeks. She is usually allowed to leave her bed at the end of the first three or four weeks, and is thought to be recovered in a month or six weeks after the operation.

The duties of the nurse are the same in each kind of Cesarean operation. In some of these operations the womb is sewed together and left in the abdomen. The patient may have other children after the operation. In other cases the whole or greater part of the womb is removed together with the tubes and ovaries. The patient cannot have a child afterward. She also ceases to be unwell. The patient should nurse her child no matter which of these operations is performed, as she can do so if she makes a good recovery.

The Child.—The nurse will be interested in noticing that the head of a child born after abdominal Cesarean section shows no evidence of pressure during birth, but is round and well shaped like the head of an infant two or three weeks old. The child is usually quite vigorous in these cases, as the method of birth is a very easy one for the infant.

THE INDUCTION OF LABOR.

It is sometimes necessary to bring on the birth of the child before the natural time. The duties of the nurse with such a patient are to prepare her in accordance with the doctor's orders. Usually the bowels are freely emptied, the patient is catheterized if necessary, the external parts are thoroughly cleansed and made aseptic, and the vagina is cleansed as the doctor orders. The method described in Cesarean section is often used. At the appointed time the doctor will have the nurse

place the patient in position, lying upon her back across the bed or table. He will have prepared his instruments by sterilization, and antiseptic precautions must be used as regards the doctor's hands and gloves and the hands and instruments or appliances which the nurse employs. The physician will introduce within the womb a bougie or elastic bag, or possibly antiseptic gauze, in such a manner as to excite uterine contractions and bring on labor. This instrument is kept in place by a vaginal tampon of antiseptic gauze, and the patient is kept in bed wearing an antiseptic napkin and a T-bandage. In some cases the doctor will order that the patient be catheterized at regular intervals, and in other cases she will be allowed to empty the bladder. The nurse in charge is expected to report to the doctor the occurrence of labor-pains or the discharge of amniotic liquid. Should hemorrhage from the vagina occur, this must also be reported at once. If the patient expels the bougie or bag, this should be reported. In many cases the insertion of the instrument or gauze is done at about the patient's bedtime, when she is allowed to rest during the night. On the day following, if labor-pains do not become active, the physician may remove the instrument or dressing and replace it by others. Should he not do this, he may remove the instrument and allow the patient to be up and about as usual. Some time is usually required to bring on active labor, and vigorous uterine contractions may not be felt for several days. Finally, however, the patient comes into labor.

THE IMMEDIATE OR PRIMARY REPAIR OF LACERATIONS.

A very important obstetric operation for the health of the mother consists in closing lacerations of the cervix,

pelvic floor, or perineum. In some cases these injuries cannot be avoided, and if they be promptly repaired the patient recovers and remains in excellent health. If, however, they are not repaired, the patient may suffer indefinitely as a result. We have already warned nurses not to assume the responsibility of stating that a laceration is or is not present. The physician must examine the patient himself to ascertain this point.

The Operation.—Instruments for the repair of lacerations, with suture material, should be sterilized and kept in readiness for each case of labor. The repair of lacerations is usually done as soon as possible after the birth of the child. In some stitches are inserted before the placenta is expelled, although in most cases the physician delays until the womb is completely emptied. If the operation will be long and painful, ether is given if the patient is in good condition. If the physician does not wish to give an anesthetic because of the feeble condition of the patient, it may be omitted. The patient is placed upon her back at the edge of the bed or table, and her limbs supported by a sheet, as already described in speaking of the use of the forceps. If possible, a Kelly pad should be employed, and a rubber sheet should be placed over the edge of the bed and a slop-jar beneath the rubber sheet. The physician will require an antiseptic solution in a sterile basin, with sponges of gauze, his instruments within convenient reach, a plentiful supply of hot water, and an antiseptic solution of the strength desired for a vaginal douche if necessary. The nurse's duties during the operation consist in preparing her hands suitably, supplying sponges and antiseptic fluid to keep the parts clean, in threading needles as required and assisting the anesthetizer, and in

having ready clean dressings to use after the operation is completed.

Care of Stitches.—The care of the stitches after the closure of the laceration is an important matter. Unfortunately, the genital tract is not like the skin in an abdominal incision. It cannot be protected by a heavy antiseptic dressing, nor can the parts be closed up absolutely, because they are likely to be soiled by discharges from the bowels and bladder. Stitches must be cleansed at regular intervals with such material as the obstetrician may direct. Care must be taken that the stitches do not become infected, and thorough surgical cleanliness is requisite in looking after them. Unless other directions be given, the nurse may cleanse the stitches as follows: She should first prepare a basin of antiseptic solution, usually mercuric chlorid (1 : 8000 to 1 : 4000). A receptacle for the soiled dressings should be at hand, and also clean dressings for application. Beneath the patient should be placed a douche-pan or bed-pan, or a folded sheet or towels, to receive antiseptic fluid. The patient's limbs should be separated and wrapped with sheets or blankets. The nurse should cleanse her hands by scrubbing them with soap and water, then rinsing them and scrubbing in water only, and then in mercuric chlorid solution (1 : 2000). Having prepared a basin of antiseptic fluid containing sponges of gauze or sterile cotton, she should first allow the antiseptic fluid to flush the parts very freely, holding a handful of gauze or cotton from the basin above the parts. Should there be secretions or discharges present, these should be carefully wiped off with the gauze and the parts made clean. Dipping the left hand then into the bichlorid solution, she should separate the labia with the thumb and fingers, and then flush off the tissues again with gauze held in the

right hand. The fluid should be allowed to fall into the vagina, and thus the stitches will be thoroughly flushed. The nurse should not rub the stitches nor pull upon them, and under no circumstances should she insert her finger or any instrument within the vagina without the doctor's orders. Antiseptic fluid may be poured upon stitches from a small pitcher; this method is especially useful to nurses when stitches are deep in the pelvic floor. When the parts have been flushed clean, a fresh dressing should be applied. In some cases the physician will order an antiseptic powder to be sprinkled into the vagina after the cleansing.

Douches.—Vaginal douches are sometimes given to cleanse stitches during the lying-in period. The douche-tube should be boiled before using, and the antiseptic solution made in accordance with the doctor's orders. The external parts should be cleansed with an antiseptic solution. The nurse's hands must be made aseptic, and the douche-tube introduced after the fluid has begun to run. The douche-bag should not be more than three or four feet above the patient. Care should be taken that the douche-tube is removed from the vagina before all of the fluid has escaped. When not in use the douche-tube should be kept in a solution of some antiseptic fluid as the doctor may order.

Removal of Stitches.—Stitches are usually removed about ten days after their insertion. The nurse should have the patient lie upon her back at the edge of the bed or table, her limbs suitably protected and placed on chairs. A basin of antiseptic fluid with gauze or cotton sponges should be ready. The external parts should be cleansed as if the patient were about to receive a douche. The instruments of the obstetrician should be boiled and his hands made aseptic. A good light should be available,

and a candle is often useful. After the stitches have been removed the perineum is cleansed with an antiseptic solution and a clean dressing is applied.

Complications with Stitches.—Cases are occasionally seen in which the patient during the lying-in period complains of much irritation about the stitches. This sometimes arises from the fact that the stitches catch in the dressing, and when the patient moves a pull is made upon the stitch, which is painful. It is sometimes useful in these cases to apply sterile glycerin to the tissues in which the stitch is embedded. This may be done under antiseptic precautions. If, when the nurse cleanses the stitches, she sees pus forming about them, she must notify the physician as soon as possible. Should the parts be very red and very much swollen, she should also notify him. If the stitch begins to cut into the surrounding tissues, it is an indication that the time for its removal has come, and the doctor must be informed of the fact. There are several ways of arranging stitches so as to give the least irritation afterward. By one method the ends of the stitches are left and gathered into a knot at the end of the group; they are then carried upward at one side and the dressing is applied from below upward. By still another method the stitches are tied together and carried upward and backward into the vagina. In other cases the stitches are cut short. Catgut and silk stitches give the least discomfort afterward, while silkworm-gut stitches are sometimes annoying.

OBSTETRIC OPERATIONS IN SEPTIC CASES.

Intra-uterine Douching.—When septic infection develops interference may be practised by the obstetrician. The washing out of the uterus with either a douche-tube

or a very blunt douche-curet is often necessary. This must be done under antiseptic precautions, the tube and instruments first thoroughly boiled, and the patient's tissues made as aseptic as possible before the operation. The patient is placed in the dorsal position and is prepared as for any other vaginal operation. Antiseptic precautions are taken by the physician and nurse; an anesthetic is often given, although omitted in some cases. Under a good light the physician will usually inspect the parts, and then, dilating the uterus if needed, he will introduce a douche-tube or curet and thoroughly wash out the interior of the womb. Unless bleeding occurs nothing will be placed within the womb. In some cases the uterus is tamponed with iodoform gauzé. If ulcers are found in the vagina or pelvic floor, strong antiseptic solutions are applied to them. Iodoform is often sprinkled very plentifully upon the tissues. The washing out or curetting of the uterus is not frequently repeated. If thoroughly done, once is sufficient.

Hysterectomy.—Should the womb become extensively diseased the obstetrician may perform hysterectomy, either complete or partial. The preparations for the operation are made as in Cesarean cases. The management and after-treatment of these patients are the same as those described.

Draining Abscesses.—In septic cases abscesses sometimes form in the pelvis or in the abdomen. These may be opened through the vagina or by making an incision in the abdominal wall. The usual precautions taken in surgery for the treatment of such cases must be employed. Where inflammation of the breast occurs with abscess, opening and draining the abscess, thorough

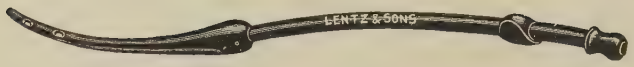


FIG. 44.—Davis's intra-uterine douche.

FIG. 45.—Pratt's uterine dilator.

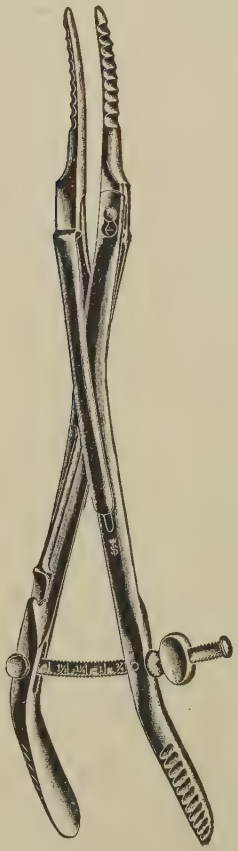


FIG. 46.—Goodell's uterine dilator.

FIG. 47. — Pean's curved hysterectomy forceps.

FIG. 48.—Kelly's hysterectomy needle.

FIG. 49.—Smith's wire eraseur.

FIG. 50.—Koeberle's serrenœud.

cleansing or curetting the tissues, and applying proper dressings must be practised. The nurse's duties for such an operation would be those similar to any surgical procedure.

PLASTIC SURGERY.

Injuries to the cervix, vagina, pelvic floor, and rectum received during labor frequently require repair some time after the birth of the child. These cases naturally come to the obstetrician for relief, as his constant observation of parturient women enables him to appreciate the injury and to remedy it in the best possible manner.

Operations on the Womb.—In many of these cases the womb is found too large and heavy, having never contracted properly after the birth of the child. In some of these patients the cervix has been torn and has never properly healed. In addition, an unhealthy state of the lining membrane of the womb is present. These cases require curetting, with repair or removal of the torn cervix.

Preparation of the Patient.—The patient should have a few days' rest in bed, so that the intestine can be thoroughly and efficiently emptied as ordered by the physician. A specimen of urine should be sent to the physician for examination, and the patient should take water freely to bring the kidneys into good working order. The skin should be cleansed by repeated bathing, with light massage. If the patient complains of any symptom or gives a history indicating a condition which might render anesthesia dangerous, this fact should be reported at once to the physician in charge.

Disinfection of the Vagina and Cervix.—To disinfect the birth-canal thoroughly, the nurse should trim the hair from the parts, or, if the physician desires it, the parts should be shaved. The vaginal mucous membrane should be thoroughly scrubbed with sterile cotton dipped

in green soap or in tincture of green soap, as the physician may order. Nurses must understand clearly the difference between green soap and tincture of green soap. Green soap is a dark brownish soft soap, resembling very much the soft soap made for domestic use by domestic methods. Tincture of green soap is green soap dissolved in alcohol. The first is a pasty solid; the second, a liquid. Some physicians prefer to use the soap; others, to use the tincture. To perform this scrubbing of the mucous membrane, the nurse should thoroughly disinfect and antisepticize her hands and wear sterile gloves; prepare the dressing-forceps and pledgets of cotton or sterile gauze; and the external parts should be thoroughly scrubbed with tincture of green soap and water or green soap and water. Introducing two fingers of the left hand, the nurse should depress the posterior wall of the vagina, thus opening the canal. Taking a ball of cotton or of gauze with the dressing-forceps, and clamping the dressing-forceps upon it, the nurse should dip it in the soap mixture, insert it in the vagina and thoroughly but gently rub the walls of this canal. She should carry the cleansing well up to the cervix, but should not thrust the gauze or cotton into the cervix. If this is done gently but firmly, it will not produce pain. This should be followed by a copious warm douche of sterile water, and after this an antiseptic douche ordered by the physician. Many obstetricians use mercuric-chlorid solution (1 : 2000), while others employ lysol (1 or 2 per cent.). Some prefer to combine lysol with the soap used in the scrubbing. After the vagina has been thoroughly douched a copious dressing of sterile gauze or antiseptic gauze is placed over the vulva.

Disinfection of the Cervix.—In many of these cases the

cervix contains an unhealthy secretion of muco-pus. This must be removed, and its removal usually requires the use of instruments. The physician will in most cases perform this manipulation himself. He will have the patient placed in the dorsal position, and, introducing a sterile speculum, he will swab out the cervix with soap, followed by water, and then by an antiseptic solution. Experienced nurses are sometimes requested by physicians to do this for them.

Preparation of the Rectum.—For such an operation the rectum must be thoroughly emptied by purgatives and enemas, and just before the operation should be copiously douched with sterile water or salt solution, as the physician may direct.

Catheterizing.—Nurses must remember that under the nervous excitement of anesthesia a patient may secrete a considerable quantity of urine. Accordingly the patient should be catheterized just before the operation begins. The tissues about the meatus should be thoroughly cleansed with bichlorid solution (1 : 2000), the catheter should have been boiled, and the nurse's hands thoroughly disinfected. After the urine has been removed the tissues about the meatus should again be cleansed with bichlorid solution.

Posture of the Patient; Table; Appliances.—Plastic operations upon the womb are performed with the patient in the dorsal or in Sims's position (Fig. 51). The nurse should prepare or improvise a table as the physician orders. It is especially necessary in these operations that a good light be available, as it is sometimes difficult to illuminate properly the field of operation. The nurse should have in readiness an abundance of hot water and the antiseptic solutions prescribed by the doctor. The limbs

of the patient must be supported in such a manner as to open the birth-canal widely, and not to be in the way of the operator. Stirrups or the sheet-sling are usually efficient for this purpose. As the nurse will be required to assist with instruments or sutures, the legs must be supported without her help. Antiseptic gauze and cot-

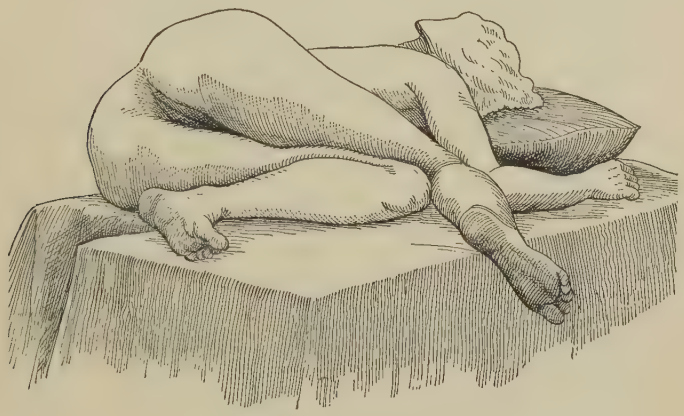


FIG. 51.—The Sims position.

ton, antiseptic vulvar dressings, and sterile T-bandages should also be ready.

Instruments and Sutures.—The physician's instruments and gloves are sterilized by boiling, and placed conveniently in a sterilizer or clean basin. It is well, if possible, to separate the needles and sutures from other instruments, to facilitate the work of the operator. As the nurse will usually thread the needles, she should know something of the sorts of suture employed. Medium-sized silk, silkworm-gut, chromicized catgut, and silver wire may be used. Some catgut is furnished in sterile, hermetically

sealed tubes, which must be broken to extract the suture. These tubes are marked by a file at the point where force should be exerted. If the nurse will take the tube in the two hands, wrapped in a sterile towel, and bend the tube sharply, making pressure at the filed point, the tube will usually break without difficulty. The catgut wound upon a small rod is then readily removed. If silver wire be employed, perforated shot are usually necessary for clamping the wire. The needles used in these operations are curved, sharply pointed, and very strong.

Dressings.—There is usually no dressing applied directly to the cervix in these cases. The vulva is covered with an antiseptic gauze dressing retained by a T-bandage.

Douches.—In many cases the physician will order douches for these patients during convalescence. These are antiseptic solutions, and should be given with a sterilized glass douche-tube under strict antiseptic precautions. Some physicians require the patient to be catheterized after an operation upon the cervix, while others do not.

Taking out Stitches.—The removal of stitches from the cervix is sometimes attended with considerable difficulty. The patient must be put in the dorsal or in Sims's position, and a good light is absolutely essential. The physician's instruments must be sterilized by boiling, and a vaginal douche is usually ordered before and after taking out the stitches. The physician will arrange the patient in such a posture that the light will be best. He will then introduce the speculum or other instruments, and may request the nurse to hold them in exactly the position in which he has placed them. She must be careful to do this as accurately as possible. The stitches are then grasped with forceps, gentle traction made upon

them, the loop cut, and the stitch removed. Nurses must be careful not to throw away stitches until they are sure that the doctor does not wish to inspect them. It is important that no part of a stitch be left behind, and to be sure that this has been avoided it is customary to count and examine the stitches after their removal.

Late or Secondary Operations for Laceration of the Vagina, Pelvic Floor, and Perineum.—*Preparation of the Patient.*—These cases are prepared for operation in the manner already described. If the laceration is extensive, several days may be required thoroughly to empty the bowel. The patient must be put upon liquid diet, and purgatives and laxatives employed freely, with copious enemas. In some cases it is necessary to restrain the bowel movements for several days after the operation, and the bowels must be thoroughly emptied to make this possible.

Disinfection of the Vagina and Rectum.—Especial attention is given in these cases to disinfecting the vagina and rectum. The hair should be removed from the parts, as already described, the scrubbing of the vagina must be done very thoroughly, and in many cases an antiseptic soap or antiseptic mixture will be ordered. Copious douches of sterile water should be given after scrubbing, followed by antiseptic douches. If the patient is allowed to empty the bladder spontaneously, the tissues about the meatus should be cleansed after each urination. In many cases the physician orders the patient to be catheterized. In disinfecting the rectum difficulty is sometimes experienced because of the irritability of the sphincter muscle. This can usually be overcome by gently but firmly stretching the muscle. The nurse

may insert the finger, anointed with some lubricant, and, making gentle traction around the muscle, may overcome to some extent the irritability which is present. In some patients hemorrhoids interfere considerably with the preparation of the patient, and increase very much her discomfort. The rectum should be cleansed by copious douching with green soapsuds, or a mixture of tincture of green soap and water, followed by the free use of sterile water, and then by an antiseptic solution. Many physicians employ normal salt solution extensively in these cases. The rectum should be washed out just before the operation, after the patient is anesthetized. In many cases, as the patient relaxes under anesthesia, fecal matter which has been retained by the intestine comes down into the rectum, and the nurse is much annoyed by having the patient's bowels move at this inconvenient time. Accordingly, after the patient is completely anesthetized it is usually wise to douche the rectum thoroughly before the operation commences.

Table and Appliances.—Operations upon the vagina, pelvic floor, and rectum are almost invariably done with the patient in the dorsal position. Many operating-tables are available, with convenient appliances for holding the limbs (Fig. 52). If the nurse must improvise a table, it should be of good height, not too wide, firm, and not too large. It should be covered with a folded blanket and sheet, and over this at the foot of the table should be placed a Kelly pad or an improvised pad made of rubber sheeting. As fluid is freely used during these operations, it is essential that the nurse so arrange the patient that very free return flow can be procured. A rubber pad is almost indispensable for this work. Some physicians use in this operation marine sponges. Most, however, use pledgets of sterile cotton or sterile gauze.

They should be prepared in abundance. It is very essential that a free supply of sterile hot water be at hand for this operation. Many obstetricians practise continuous irrigation of the field of operation with hot sterile water, and it is evident that there should be an abundant supply. A fountain-syringe should be hung within convenient reach; and if continuous irrigation is to be performed the nurse must obtain from the physician or by his order such a tube as he desires. If no especial tube is available, the largest size medicine-dropper may be taken, its rubber portion removed, and the larger end of the glass portion inserted into the tube of a fountain-syringe. This simple appliance has proved very convenient. As the legs of the patient must be kept in position for some time, the nurse should see that suitable and comfortable appliances are at hand for this purpose. It is much better to take a little time at the beginning of the operation and have the patient in perfectly good position, than to have the operation interrupted afterward by the necessity for change. Hot water is sometimes required to check oozing during these operations. Water at a temperature of 100° to 110° F. must be in readiness. Solutions employed are sterile salt solution and dilute antiseptic solutions.

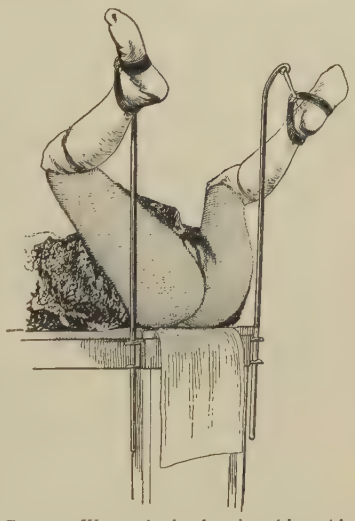


FIG. 52.—Woman in the dorsal position with feet supported in Edebohls' stirrups.

Instruments and Sutures.—The physician's instruments

will consist of a scalpel, scissors, dissecting-forceps, tenaculum-forceps, hemostatic forceps, and uterine dressing-forceps. If silver wire be employed with shot, a shot-crusher is necessary. Suture material employed is silk, silkworm-gut, chromicized catgut, kangaroo-tendon, or silver wire. A sufficient number of needles must be provided so that the obstetrician shall not be delayed by time lost in having needles threaded.

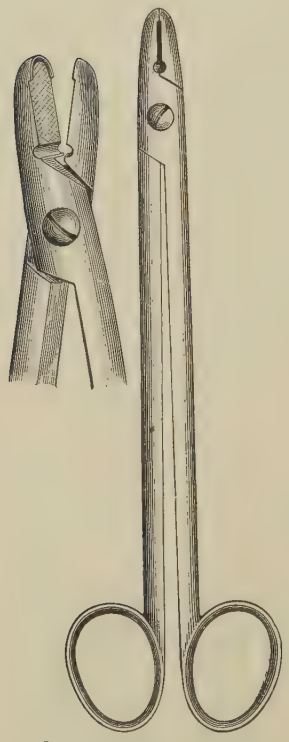


FIG. 53.—Shot compressing forceps.

Posture of the Patient.—This is usually the dorsal position, occasionally Sims's. In cases of opening or fistula between the bladder and vagina the patient may be put for a time in a modified knee-chest posture. It is very important that she be put in exactly the position desired after she is anesthetized, and it is better to wait until the patient is relaxed before attempting to place her in position. Most operators prefer to employ stirrups or leg-holders, while some prefer that the patient's limbs be held by nurses and assistants.

Dressings.—Sterile or antiseptic gauze in strips two inches wide should be prepared. Sterilized or antiseptic gauze with sterile or borated cotton should be in readiness for the preparation of vulvar dressings. T-bandages are used in these cases.

Duties of the Nurse during the Operation.—During this operation the nurse may be required to direct the stream of water upon the parts, to hold instruments, thread needles, hand sponges, or in some cases to sponge. She should be especially careful to maintain an aseptic condition of her hands, using sterile gloves, and to be sure that the dressings, instruments, and appliances which she prepares are clean and sterile.

The Care of the Stitches.—Many obstetricians have no douches given after plastic operations. The patient, however, is catheterized under strict antiseptic precautions, and the parts are carefully protected by a large vulvar dressing of antiseptic gauze and cotton. Other operators prefer the use of vaginal douches given under strict antiseptic precautions.

The Bowels.—Where there has been a very extensive tear of the vagina and rectum the obstetrician may give opium to prevent a movement of the bowels for several days after the operation. In administering this drug, the nurse must be careful to follow the dose and interval exactly, and to note the development of the constitutional effects of opium. It is usually given by suppository, by hypodermic injection, and occasionally by the mouth. When the laceration has not opened the bowel widely the physician will usually order the bowels moved on the second or third day after the operation. Laxative medicines followed by enemas are ordered. Where the laceration has been extensive the bowels may not move for five or six days after operation. When this must be done the physician will prescribe laxative medicine and enemas. The nurse should watch to detect any symptom of desire on the part of the patient for a movement of the bowel. It is often customary when such occurs to inject into the

bowel from two to six ounces of sterile olive oil, making the injection very gently and having the oil warmed to 98° F. The patient is encouraged not to strain, and to retain the oil if possible. When the patient feels that the bowel movement is inevitable, an enema of simple warm water or of soapsuds and water is given. In giving the enema, a rubber catheter, not too large, should be used and great care taken in passing it, that no harm be done the stitches. After the bowels have moved, the nurse should wash out the rectum with sterile water or normal salt solution, and cleanse the parts thoroughly with antiseptic solutions, and, if the doctor orders, should give a vaginal antiseptic douche. She should report at once to the doctor any signs that fluid from the bowel has passed through into the vagina. This may happen for a few days after the movement of the bowels, but if the vagina and rectum be kept thoroughly clean the parts usually close without further complication. Should the bowels become distended with gas at any time, and the patient threaten to strain and bear down, the nurse may very gently pass a rectal tube, allowing the gas to escape.

Prevention of Tearing the Stitches.—When the patient recovers from the anesthetic she may become greatly excited, and be seized with a strong desire to bear down and have the bowels move. If this be not controlled, the patient may tear asunder some of the stitches and ruin the result of the operation. It is customary for physicians to instruct the nurse to use opium to control such cases. The nurse should give the hypodermic injection or the rectal suppository when such symptoms appear. She can do much to control the patient by gentleness, by flexing the thighs upon the trunk, by turning the patient on the left side, and by encouraging her not to yield to pain or disagreeable sensations.

Removing the Stitches.—The stitches are usually removed in from ten days to two weeks after the operation. Chromicized catgut usually remains in place from ten to twenty days, the knots finally coming away with a douche or dressing. Should soreness, redness, and pus appear between the stitches, the nurse must notify the physician at once. If soreness only be present, the application of sterile glycerin, made with sterile gauze or cotton, to the tissues about the stitches will often be followed by relief. For the removal of the stitches the physician will usually place the patient in the dorsal position, her limbs supported properly, and instruments and antiseptic solutions available. A good light should be obtained. After the removal of the stitches a vaginal antiseptic douche is often given.

Convalescence of the Patient.—During her convalescence the patient must be catheterized, or may pass her urine as the physician orders. It is usually necessary to employ enemas for some time. It is rarely needed to bind together the patient's limbs, although this is occasionally done. Especial care must be taken that the patient does not get up and about too soon, and that she does not have a hard and constipated bowel movement, causing her to strain freely. A slight mucous discharge persists for some time after these operations in many cases, but a purulent discharge should not occur, and would indicate that infection had arisen. Nurses must not understand that septic infection may not arise in operations which do not open the peritoneum. Although most plastic operations are done successfully in good hands, it is possible for fatal infection to arise during or after one of these operations, with the usual symptoms of blood-poisoning. The nurse cannot be too careful or particular in her antisepsis and in the aseptic care of herself.

CHAPTER XI.

NURSING IN PUERPERAL SEPSIS.

In almost all cases puerperal septic infection can be prevented, and this occurrence must be looked upon in most cases as resulting from some omission or wrong-doing of those who care for the patient. When it does occur it is very important that the patient be properly cared for, as her recovery will depend very much upon the nursing which she receives.

The **prevention** of **puerperal sepsis** requires the strict observance of those antiseptic precautions invariably practised by careful surgeons. *The nurse should consider each pregnant and parturient patient as a surgical patient, and, so far as antiseptic precautions are concerned, an abortion or labor must be treated as a surgical operation.* By this we mean that in attending a case of abortion or labor the nurse must exercise strict antiseptic precautions regarding herself, the instruments, appliances, dressings, and the external genital organs of the patient. She should not insert her finger or an instrument within the genital tract of the patient without the consent of the obstetrician, for the same reasons which would prevent her from inserting her finger into a wound or into the abdominal cavity during an operation.

Symptoms.—The symptoms of puerperal sepsis are fever, with tenderness in the abdomen, a large, soft womb, and usually an altered condition of the lochial discharge.

In sepsis the patient has been attacked by germs which will destroy her blood and exhaust her vitality unless she can resist them. In this contest she requires all the assistance which proper nourishment, stimulus, and surgical help can give her. Puerperal sepsis sometimes begins with chill. At other times the temperature rises steadily from the first to the third or fourth day. The pulse is rapid, and there is usually constipation or diarrhea.

The nurse must report to the attending physician a chill, rise of temperature, or a rise of the pulse-rate of the patient. Nurses must not be deceived by a slight sensation of chilliness which is often felt immediately after labor. This is very different from the distinct rigor characteristic of puerperal sepsis.

Cleansing the Birth-canal.—When the physician sees his patient he will usually find it necessary to examine not only the external surface of the body, but also the condition of the genital tract. The nurse must prepare an antiseptic solution, plenty of hot water and dressings, and place the patient on her back across the bed for a bimanual examination. It is usual to wash out the birth-canal as thoroughly as possible either before or after such an examination. The nurse must have ready the appliances and solution for a douche; and if an intra-uterine douche be given there will be needed normal salt solution or an abundance of hot sterile water. After the examination vaginal douches may be ordered at regular intervals. These must be given with the antiseptic precautions already described. It is not customary for nurses to give intra-uterine douches, and *the nurse should decline to assume so responsible a task.*

The obstetrician may often take cultures from the interior of the uterus or vagina to determine the nature

of the germ which is producing infection. For this procedure the nurse should very carefully cleanse the external parts with soap and water and antiseptic solution. The obstetrician will then take material from the vagina for examination, and cleanse the vagina as thoroughly as possible. Through a sterile speculum a sterile glass tube is then passed into the uterus, and some of the discharge from the uterus drawn into the tube by a piston syringe attached to the glass tube by rubber tubing. The glass tube is then removed, and immediately sealed with sealing wax. It is sent to the laboratory, broken open, and its contents examined.

Purgatives; Counter-irritation.—The patient will usually be ordered purgative medicines and glycerin and saline enemas. The diet will be liquid; and if there is much pain in the abdomen the nurse may be ordered to place upon the abdomen a turpentine stupe, with or without an ice-bag. In some cases hot applications are made. To prepare a turpentine stupe for such a case, a piece of flannel is selected large enough to cover the abdomen from the pubes to the epigastrium. This should be folded in two thicknesses, and should be wrung out of one pint of water to which has been added one tablespoonful of spirits of turpentine. This is then laid smoothly upon the abdomen, and over it is placed one thickness of thin flannel, and upon this an ice-bag or hot-water bag. The choice is left to the attending physician. Such an application is clean, easily renewed, does not blister if carefully watched, and relieves pain in most cases. If the action of the turpentine is not well borne, it may be removed and the ice-bag or hot-water bag be used alone.

Treatment of Fever.—For the reduction of fever in septic cases cold is commonly employed. Cold

sponging and the use of the ice-bag or of the cold pack are the methods generally used. The cold sponge is usually more effectual if a tablespoonful of alcohol be added to the pint of cold water. If the patient sweats freely, a little ammonia may also be added. With some patients the use of cold does not agree, and considerable depression and shock follow a cold bath or pack. In these cases good results are obtained by sponging the patient with hot water to which ammonia or alcohol has been added. When the temperature is high and the patient sweats profusely, she will usually not be able to take food during the highest fever. If the temperature be reduced, she can, however, retain and assimilate liquid food. The nurse must watch her opportunity in these cases to feed and stimulate the patient when the temperature has been reduced by sponging or packing. In some cases friction with ice, as sometimes employed in typhoid or sunstroke, will be found advantageous.

Nourishment.—The question of feeding in these cases is of the utmost importance. Milk must usually be peptonized to be readily absorbed. Rapid peptonization by the cold process gives the best results. Milk-foods, such as junket, koumiss, buttermilk, and custards, should be used freely. Broths and soups, beef-juice, white-of-egg water, raw eggs beaten up with whiskey or sherry, are also needed. If fever be very high and thirst great, small quantities of cool drinks at frequent intervals are required. The best and simplest ice-cream and ices are occasionally useful if taken partially melted. The nurse must employ every expedient to secure the taking of food. The patient should not be asked what she desires, but nourishment should be brought to her at favorable intervals and without delay and argument. It is

most important that these patients should take a considerable quantity of pure water. If this is given in small quantities frequently, it will not distress the stomach, but prove most comforting to the patient. Iced water should not be used, but that which is pleasantly cool should be selected. Aerated water, very weak lemonade without sugar, or cream of tartar lemonade, are useful.

Stimulation.—The use of alcoholic stimulants is very important in septic cases. Wines are seldom employed extensively, as they are rarely pure and often disturb digestion. The best quality of whiskey and brandy is usually employed. A thoroughly septic patient will often consume enormous quantities of alcoholic stimulants without the least sign of intoxication. Stimulants may usually be given with water, and as a beverage to quench thirst. Better results are obtained in the long run by giving food and stimulants separately than by combining alcohol with articles of diet. In addition to alcoholic stimulants the nurse may be ordered to administer tonic and stimulating medicines, occasionally by hypodermic injection.

As hypodermic injections may be continued for some time in severe cases, nurses must be especially careful to cleanse the skin as thoroughly as possible and to keep the hypodermic needles thoroughly boiled and disinfected. Nurses must also take precautions against pricking themselves with these needles as they are used upon a septic case, and the nurse might develop sepsis from such a wound. Salt solution is often extensively used in septic cases, usually by injection into the bowel for absorption. In severe cases it may be injected through a hollow needle, beneath the skin of the outer side of the body, or a vein may be opened and salt solution injected

into it. Where the rectal method is employed the bowel must be thoroughly but gently irrigated once in twenty-four hours through a rectal tube passed as far as possible with warm salt solution.

Operations.—Operative treatment may become necessary during puerperal sepsis. Washing out of the womb, curetting the uterus, incision into the vagina or into the abdomen to empty an abscess, or abdominal section followed by the removal of diseased organs may be performed. The nurse must prepare for these operations as is usually done. The preparation for Cesarean section already given may be followed if other orders are not received. Septic patients are often annoyed by diarrhea. The discharges may be irritating in character. Unless the patient be well cared for, much suffering and the formation of a bed-sore may occur. Strict cleanliness, with frequent changing of the dressing and the use of healing ointments, will keep the patient in good condition.

Bed-sores.—In some cases bed-sores form very easily. Bathing with alcohol or alcohol and alum, the use of rubber adhesive plaster, the use of ice, and turning the patient frequently upon the side may all be employed. With some patients, lying directly upon a blanket is one of the best preventives of bed-sore. The use of rubber rings or sheeting is objectionable because of its heating and irritating properties. It is better to use ample dressings and little rubber material about the patient. Ointments are often of value. The mixture known as Hornor's ointment is an excellent one; it is composed of equal parts of alcohol and castor oil, with sufficient powdered oxide of zinc to make a paste. The mattress used in puerperal septic infection should be burned at the termination of the case.

The Nurse.—A most important matter in this connection is the care which the nurse must take of herself. A scratch, a cut, or a neglected hang-nail on her hands may result in infection, in serious illness, or death. The constant demand upon her strength and the anxious and depressing nature of the case make such patients difficult to attend. It is necessary to wean the child, and this adds to the nurse's cares. She must be very cautious in the care of her hands, and rubber gloves or rubber fingers are excellent in dressing a septic patient. The use of a healing lotion or ointment, applied upon the hands and around the nails before retiring, will prove of great value. She must be careful to take a regular allowance of fresh air and sleep, and to maintain her nutrition in every possible way. She must be very careful regarding the avoidance of infection in the eyes. Antiseptic solutions sometimes spatter into the eyes, setting up severe irritation. Septic fluids may also gain access to the eyes. The nurse must not rub her eyes while attending a septic case. Should smarting and redness occur, she should consult an ophthalmologist at once.

On leaving the case the nurse must spend at least a week in disinfecting her clothing and belongings and in cleansing her own body. The hair must be thoroughly washed not only in the usual manner, but also with bichlorid of mercury solution 1 : 4000 or carbolic acid solution, 1 per cent. Repeated baths should be taken, and, in addition, an antiseptic bath of bichlorid 1 : 4000, or 1 per cent. carbolic acid. The throat and eyes should be especially examined to determine the presence of infection. If possible, the nurse should not take an obstetric or surgical case for a month. She should be as much as possible in the open air, and exercise the utmost caution to secure cleanliness.

Nursing the Child.—Puerperal septic infection usually makes it necessary to stop the mother's nursing. The breasts may become infected and abscess of the breast be added to other complications. The child must be fed at regular intervals with food prepared by the doctor's written orders. Care must be taken that the child does not become infected at the umbilicus or in the eyes or mouth. It is better that the child should be with the mother as little as possible in such a case.

Such patients require two or more nurses. It is impossible for one nurse to give mother and child proper treatment without sacrificing their good and her own health. The case is so serious and so much depends upon the patient's nursing that two or more nurses should be in attendance. The physician must decide whether one nurse shall take exclusive care of the mother and the other of the child, or whether they shall alternate. It is usually better to have one nurse to do the surgical dressing for the mother, and the other nurse to dress the umbilicus and bathe the child.

Septic cases require constant and careful attention. The mother should, if possible, have two nurses for herself, and the child a separate nurse. The mother's nourishment and stimulation must be given at regular intervals, night and day, and if she has high fever cold must be applied whenever the temperature rises. It is impossible for one nurse to properly do this for twenty-four hours. A separate nurse is needed for the child, so as to avoid the danger of infecting the child. As the mother cannot nurse the child in these cases, and it must be artificially fed, it requires an unusual amount of attention.

CHAPTER XII.

COMPLICATIONS OF THE LYING-IN PERIOD.

COMPLICATIONS WITH THE BREASTS.

Excess of Milk.—The flow of milk may be excessive or deficient. In the first instance the patient is annoyed by having her clothing and the bed soiled by the constant leaking of milk. To prevent this the nurse should keep the breasts abundantly covered with sterile gauze, which will soak up the excess, and the patient's diet will be altered as the physician shall direct. It is usual in these cases to withhold liquids, cereal foods, cocoa, and some of the vegetables, and to give the patient a diet poor in liquids, in starches, and in sweets. The most strict cleanliness must be observed in these cases, to avoid the retention and decomposition of milk in the clothing or upon the body. The supply usually diminishes when the patient gets up and is able to be about.

Lack of Milk.—Too little milk may be the result of lack of physical development or vigor in the mother, or may be caused by depressing mental influences or by improper diet. Worry will produce almost entire cessation of the secretion of milk, and great and sudden mental shock often produces the same result. Hence the nurse must be careful not to depress the mind of a nursing patient, but to encourage and comfort her in every way in her power. When the secretion of milk is deficient the nurse can assist it by massaging the breast, by following strictly the diet ordered by the doctor, by encouraging the patient, and by causing the child to nurse at regular intervals and as completely as possible. If the

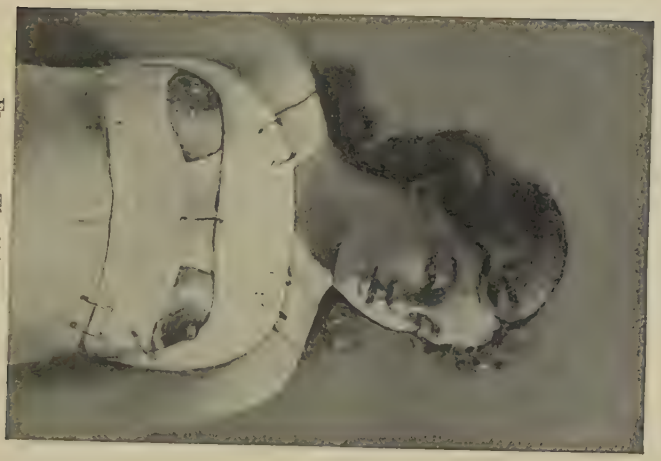


FIG. 54.—The Y-bandage.

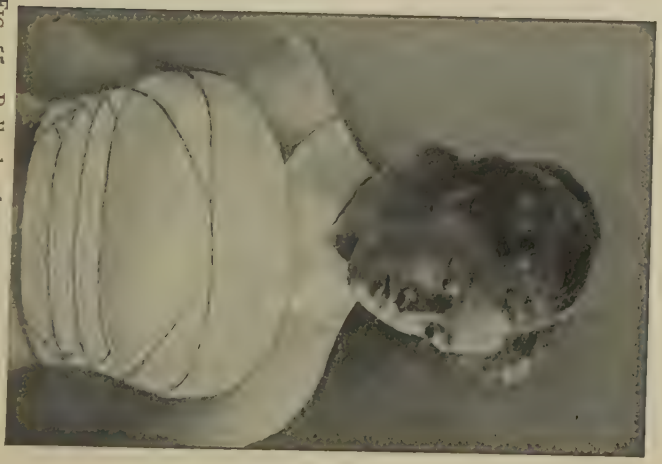


FIG. 55.—Roller bandage applied to both breasts.

patient be encouraged to believe that the secretion of milk will not fail, much will be done to help to bring about the desired result.

Abnormal conditions in the breast often arise which require careful attention to prevent the development of serious mischief.

Distention of the Breasts.—Caked breasts are caused by failure of the milk to escape properly through the nipple. Sometimes it seems as if the outer skin of the breast is so firm that it will not yield and permit the flow of milk. In other cases the breasts are so full that it is impossible to obtain milk from them. This condition is a serious one, because if the accumulation cannot be relieved, and should infective bacteria be contained in the breast, an abscess will form. The sensible use of the breast bandage (Figs. 54, 55) will do much to prevent this condition. Massage is an excellent help, and must be done by first washing the breast with soap and water and making the hands of the nurse aseptic. Having washed her hands thoroughly with hot water and soap, the nurse should rub the breast gently with the ends of her fingers from the outer border of the breast toward the nipple. She should raise the breast gently and draw it toward the median line at the same time. She may gently knead the breast, if the patient experiences no inconvenience during the kneading. She should rub lightly with a gentle touch, but thoroughly and steadily. The massage may be continued from ten to twenty minutes. During the last five or ten minutes the nurse should apply to the breast warm sterile olive oil, rubbing it in thoroughly by the massage. The best test of the success of this massage is the relief which the patient experiences. Should massage cause acute pain, it must be stopped at once. Should the skin over the breasts remain brightly reddened after massage, the

FIGS. 56, 57.—Massage of the breasts.

FIGS. 58, 59.—Massage of the breasts.

treatment must be suspended. Massage should be practised just before the regular time for the child to nurse. After this, if a breast-pump be cautiously applied, a little milk will be extracted. If then the child is put to the breast, it will probably succeed in removing a considerable quantity of milk. Massage should be practised as often as the doctor directs, and is usually done in the manner described. Physicians occasionally order hot fomentations to be applied just before the child nurses, for the relief of caked breast. Gauze or soft flannel may be used wrung out of sterile water, and over this oiled silk or sheet rubber may be applied. Fomentations are not used so frequently as massage.

When the breasts are engorged the physician will order purgative medicine, and usually salines. This has a decided influence in reducing the amount of fluid. The diet will also be regulated and confined as much as possible to solids. When obstinate engorgement is present, with great tension, fomentation should first be applied for fifteen to thirty minutes, followed by massage for twenty minutes. The child should then nurse. The whole proceeding will consume an hour or more.

Should the mother's milk disagree with the infant after fomenting and massage, some milk should be taken from the breasts with a pump. This will usually be a yellow fluid, containing an excess of fat. This should be discarded, and the milk which comes after that is suitable for the child. If the child can nurse, it may take its food after the first milk has been removed by the pump.

Medicines.—Medicines are sometimes applied directly to the breast. Belladonna ointment or plaster, or a solution of atropin, as the doctor may direct, may be applied upon gauze or lint which has previously been

sterilized. Occasionally a physician orders medicine administered internally to check the flow of milk. As belladonna is the drug usually prescribed, the nurse will remember its effects. When the patient is under its influence the pupils are dilated, the mouth and throat are dry, the pulse is rapid, and the skin is often of a bright reddish color. The nurse must report to the doctor any signs of the physiologic effects of this drug.

Drying Up Milk.—Under this title is commonly meant the cessation of the secretion of breast milk, when for some reason there is no occasion for continuing the secretion. The most typical example is seen in cases where the child dies and the mother has a free secretion of milk. It has been found by observation that it is unnecessary to massage, pump, and foment the breasts in these cases, or to interfere with them except in the rare instances where breast-abscess may develop. If the child does not survive, or if it is desired to wean the child entirely, the breasts should be thoroughly washed with soap and water, rinsed with sterile water, and thoroughly disinfected with bichlorid solution, 1 : 2000. Especial attention should be given to the nipples. They should then be covered with a light layer of sterile gauze, and smoothly and tightly bandaged.

If there should be considerable pain and distention, and if the physician permits, lead-water and laudanum may be applied upon surgeons' lint over two-thirds of each breast, beneath the gauze and beneath the bandage. Over the surgeons' lint may be placed wax paper, and this application may be made twice daily, morning and night.

The results of this treatment are most satisfactory, and there is far less danger of abscess, while the patient is spared great inconvenience and distress. Should an area

of pain, redness, and swelling develop, the physician in charge must be notified at once. In our experience, however, abscess has not occurred following this treatment.

FIGS. 60–62.—The breasts in pregnancy. FIG. 60. Typical signs in a brunette, including follicles and primary and secondary areolæ. FIG. 61. Elevation of primary areola (*E*) in profile, compared with an areola which is not elevated (composite photograph). FIG. 62. Well-formed, firm breast and nipple in a brunette. (*American Text-Book of Obstetrics.*)

Abnormal Nipples.—A frequent cause of caked breast and abscess is found in diseased or abnormal

nipples. Such a condition can usually be remedied during pregnancy. If not, however, and if the nipple can be drawn out sufficiently for the child to grasp it, other conditions can usually be overcome. To draw out the nipple, the mouth of the child is undoubtedly the best apparatus. Next to this is some form of breast-pump, of which there are two. In one the suction is made by the expansion of a rubber bulb, and in the other the suction is made by the lips of the mother or nurse through a piece of rubber tubing. The breast-pump should be carefully cleansed after use. Its glass portion should be frequently boiled, and when not in use it should

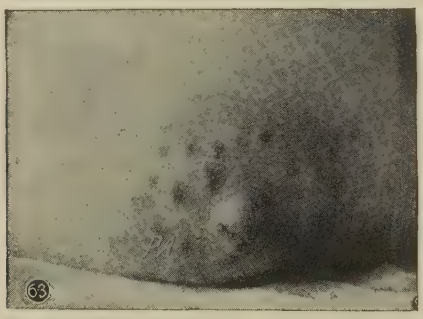


FIG. 63.—Typical signs in a blonde: *F.* follicles; *PA.* papillæ (*American Text-Book of Obstetrics*).

be kept in a saturated solution of boric acid. The breast-pump must be used very gently, to prevent bruising and injuring the glandular structure. The nipple may be drawn out with a heated bottle, by heating the bottle in water, emptying it rapidly, inverting it and applying it over the nipple. As the bottle cools the nipple will be drawn through the neck of the bottle. The practice of applying the mouth of another person than the infant to the breast to draw out the nipple should not be encouraged. When the nipples are not only depressed,

but also deeply inverted, so that cup-like depressions are formed, the patient cannot nurse. Great care is requisite in keeping these depressions perfectly clean, as milk may accumulate and undergo decomposition in them.

In addition to sunken or depressed nipples, great difficulty is found when the nipples are so small that the flow of milk is very limited. If the child is vigorous and hungry, it sucks air into the stomach with the milk, and colic and indigestion result. In other cases the covering of the nipple is so sensitive that vigorous suction by the infant removes the superficial cells and causes the part to become sore. In these cases the child must nurse through a nipple-shield. Those most usually employed consist of a glass bell with a rubber nipple (Fig. 64). They are usually efficient, and the simplest are always to be chosen. Nipple-shields are sometimes improvised by taking a bit of wax, hollowing it out, and piercing holes through it with a large needle. The nipple-shield must be kept thoroughly clean by boiling, and when not in use it should be kept in a saturated solution of boric acid. When the nipples are sensitive they must be cleansed with the greatest care, as already described, and the physician should be requested to prescribe some suitable application. Sterile olive oil, an ointment of lanolin containing boric acid, castor oil, and bismuth subnitrate are often employed. The physician will sometimes make applications of an astringent or stimulating nature to the nipples.

FIG. 64.—Nipple-shield.

Cracks and Fissures in the Nipples.—Cracks and fissures may occur, and may be so deep as to cause bleeding at the time of nursing. It must be remembered

that in some cases the nipple is fissured congenitally, and that the condition is not necessarily one of disease. Such cracks or fissures usually divide the nipple into two portions, but do not present a sore or wounded surface when the child nurses. For cracked or fissured nipple strict antiseptic cleansing as described and the use of the nipple-shield are usually sufficient. The physician must always be asked to prescribe an application to be used after the child has nursed. We have repeatedly seen a cracked and fissured nipple heal and become sound, although the child was nursed, under the conscientious care of good nurses. If, however, infection occurs, then an abscess of the breast usually follows.

Ulcers on the Nipples.—Nurses should observe any sore or ulcerated spot upon the nipples. Syphilitic women sometimes have sores upon the nipple, and occasionally a woman with a tubercular breast has such a condition. This must be at once reported to the physician, and it will very likely result in stopping the nursing of the child.

Abnormal Milk.—Nurses are sometimes puzzled by the appearance of the milk. The first milk obtained after the birth of the child may be very yellow and very thick. It may almost resemble pus. The attention of the physician must always be called to such a condition. In other cases a little blood may come with the first milk, while in some patients the milk is excessively thin and watery and apparently very poor.

Breast-abscess.—When the patient complains of pain in some portion of the breast, and that portion is found hard and firm and resisting, and when this does not soften with the method of treatment already described, a breast-abscess is threatened. We know that

under some conditions, no matter how careful the nurse and doctor have been, abscess may occur. Frequently, however, we must suspect negligence or carelessness to have had something to do with the production of the abscess. When pus actually forms the temperature rises as high as 103° or 104° F., usually about 102° F. The breast is sensitive to pressure, and over the hard area a red or pinkish color of the skin is seen. Such symptoms must at once be reported to the physician.

Drainage.—When pus has actually formed the breast must be incised and the abscess emptied and drained. Some physicians apply hot fomentations to hasten the breaking down of the infected material. Others use the bandage only, and prefer to incise the breast so soon as evidences of infection are positively found. The operation of opening and draining the breast should be done under ether. The patient is prepared by abstinence from solid food and by purgation. The nurse must have ready an abundance of hot water, antiseptic solutions, one or two half-pound cans of ether, several breast bandages or binders, antiseptic gauze and cotton, and stimulants. The physician may require drainage-tubing, or he may prefer to use gauze as a drain, or to employ strands of lint or some other material. The nurse should ask what he wishes for this purpose. A rubber sheet will be required, and if possible a kidney-shaped pus-basin should be employed. An abundance of old linen may also be needed.

Operation.—The breast is prepared for incision by washing thoroughly with soap and hot water, then rinsing with hot boiled water, and then washing with mercuric-chlorid solution (1 : 2000). The physician's instruments should have been sterilized by boiling. A supply

of sterile towels should be available, on which gauze may be cut in convenient strips. The patient's clothing should be removed from the chest, and her shoulders and the sound breast protected by a soft, thin blanket and by clean linen. She usually remains in bed during the operation, although in extensive abscess of the breast the operator may prefer to place her upon a table. The physician will require a syringe for washing out the abscess-cavity. A small glass piston-syringe is very convenient for this purpose, while some prefer to use a fountain-syringe. The nurse must have ready such a syringe and solution as may be ordered.

When the patient is anesthetized and the breast has been prepared, the physician will incise the abscess, explore the breast thoroughly, and decide whether it is necessary to use drainage-tubing or to make other openings. The nurse should supply antiseptic solution, gauze or cotton sponges wet with an antiseptic solution, and dressings and a bandage when the abscess has been emptied. If care be taken, the patient's bed need not be soiled; but without this, fluid is very apt to find its way into the center of the bed, requiring a complete change.

These cases need a daily dressing for varying periods, and the nurse must have ready the solution and dressing materials which the doctor may desire. Recovery from this condition is often tedious and prolonged, the abscess-cavity being slow in closing. In neglected cases the abscess may burst spontaneously, or the pus may burrow beneath the breast or into the armpit and several openings may occur. In very severe cases it is necessary to make a free incision and remove all of the infected gland-tissue. Dressings are usually kept in place by a breast binder. If the child is to nurse from the

healthy breast, the physician may prefer to use a broad roller bandage of flannel, which can be so applied that the nipple of the healthy breast is not included in the bandage. Nurses in attendance upon a case of breast-abscess must remember to cleanse their hands with great care, lest they infect the infant or the genital tract of the mother, or some portion of their own body.

In cases of breast-abscess, where the condition is recognized early and the abscess is promptly incised and drained, it is interesting to observe how little permanent damage to the breast results. After subsequent pregnancy patients are often able to nurse the child from such a breast.

PUERPERAL THROMBOSIS OF THE LOWER EXTREMITIES.

In the words "milk leg" is shown an ancient delusion. This name was given to swelling of one or both thighs occurring after labor, which was thought to be caused by excessive secretion of milk which ran from the breast through the veins into the legs, and caused the peculiar white and glistening appearance of the skin. The proper name of this condition is puerperal thrombosis of the lower extremity. A clot, or plug, forms in one or more veins near the brim of the pelvis, blood accumulates in the extremity, and the serum, or water, of the blood stretches the skin, making it white and glistening. In some cases the clots, or plugs, come from the uterus; and if the womb is infected a very dangerous condition of blood-poisoning will result. In other cases infection is not present, but the clot, or plug, is formed in the vessel and will gradually become dissolved or absorbed. This condition sometimes follows

exertion on the part of the patient too soon after confinement.

The first symptoms are pain in the brim of the pelvis, and a feeling of stiffness and weight in the extremity followed by swelling. The treatment usually employed consists in elevating the leg, the patient remaining upon her back in bed or in some cases upon a couch, in bandaging the leg, and in applying lotions or remedies to prevent inflammation of the skin and allay burning or painful sensations.

The physician will improvise an inclined plane, which the nurse or physician must cover with cotton-batting or other soft material held in place by a bandage. The patient's leg and thigh must be raised as high as is comfortable to herself. Beginning with the toes, the leg should be bandaged and the thigh up to the brim of the pelvis with such a bandage as the doctor will order. Some physicians do not apply a bandage, but have the leg covered with cloths wrung out of some medicinal application. The occluded vein can often be felt like a cord extending for several inches below the brim of the pelvis. In some cases the physician will order applications made directly over this hardened portion. The patient's diet is limited in these cases. The nurse is ordered to keep the bowels freely open. Recovery usually proceeds steadily but slowly. If the patient has chills with high fever, blood-poisoning, or pyemia, has developed, and the case is very serious. When recovery is well advanced the physician may order massage for the swollen limb, which must be given with great gentleness. Alcohol sponging, or sponging with boric-acid solution or with weak carbolic-acid solution, is often employed in these cases. Should the nurse notice blisters or blood-

spots upon the surface of the limb, she should notify the physician at once.

In severe cases infection may burrow beneath the tissues of the thigh, and it may be necessary to incise these tissues deeply under ether, and allow the pus and sloughing material to come away. Such cases are complicated surgical cases, as the patients often have high temperature and recover slowly.

AFTER-PAINS.

Patients are sometimes greatly annoyed by contractions of the uterus after the child and its appendages have been removed. These are called "after-pains." They usually indicate the presence of a clot within the womb. They are often excited by the nursing of the child, and in highly nervous and anemic patients they may become so severe that remedies must be used to control them. The nurse should not encourage the patient in thinking that slight after-pains are injurious or that they produce great suffering. Much can be done to influence the mind of the patient in this regard, and in mild cases after-pains disappear in a few days. Where they are severe and prolonged the physician may find it necessary to remove a clot from the uterus with his finger or by the use of a curet. The nurse must prepare for such a procedure in strict antiseptic fashion, and every antiseptic precaution about the doctor's hands, the patient, and the nurse should be observed.

The nurse should report to the physician at once if the womb remains large after delivery and if the patient has after-pains. A large clot may be forming, which may finally be expelled with a very serious hemorrhage.

Nurses are sometimes ordered to practise gentle massage of the uterus in these cases, to assist in securing good contractions and in preventing the formation of a clot. Hot applications over the womb, turpentine stupes, hot and stimulating drinks, anodyne medicines, fluid extract of ergot, strychnin, and quinin are among the remedies prescribed in the treatment of this condition. The nurse must remember that to a moderate degree after-pains are a favorable indication, as they show that the womb is contracted, and promise well for involution and a prompt recovery.

CHAPTER XIII.

PUERPERAL MANIA.

Insanity may attack the pregnant and puerperal woman in several forms. Of these, the most common is melancholia, while acute mania may develop and prove fatal. In these cases the patient often seeks to destroy herself, and endeavors to kill the child. Hence the nurse must be exceedingly cautious in the general management of these patients. Such cases occur among women in whom there is a family history of insanity, or in women who are exceedingly nervous or who have had some great calamity come upon them during pregnancy. If the disease be hereditary, the patient's chance for recovery is not a very good one; and if the child dies the mother is less likely to recover. If, however, the patient has previously been strong and well, the chance for recovery is a good one if time and patience be used in the treatment. If the child survives, as the acute stage passes away the mother will find great comfort in its care.

Treatment.—Restraint and absolute quiet are necessary during the acute stage; if the disorder develops during pregnancy, the patient may become actively maniacal during labor. She would then require anesthesia and the services of sufficient assistants to control her thoroughly. Severe lacerations sometimes occur in these cases, and the child may be injured by its rapid expulsion. After the birth of the child the mother must not be

trusted to nurse it. Should the supply of milk be ample, an effort may be made to have the mother nurse it, but with the closest watchfulness lest she attempts to do it injury. When convalescent and quiet an out-door life is best adapted for the mother's complete recovery. Her feeling for the child should be encouraged in every possible way, and her general health built up and made thoroughly good.

Precautions.—The nurse must remember the absolute uncertainty attending upon patients of unsound mind. The child is never safe in the presence of the mother in these cases unless a protector be at hand. The mother should never be left alone lest she attempt to destroy herself. The nurse must also have in mind her own safety, and not consent to go into situations where the patient could destroy both nurse and herself. The nurse can be of the greatest service to the patient, and in many cases she will have the satisfaction of seeing the patient's reason return and her affection for the child develop in a natural and most salutary manner.

CHAPTER XIV.

PARTIAL OR MIXED FEEDING.—WEANING.—ARTIFICIAL FEEDING.

Advantages of Nursing.—It is a great advantage to mother and child to have the child fed by the mother. For the mother, it produces vigorous contractions of the womb and greatly hastens her recovery. For the child, it avoids indigestion and is the best hope that the child will survive. Every effort, then, should be made to establish and continue nursing. This, however, may wholly or partially fail. A mother may be so debilitated that very little milk can form, and the child be in danger of failure from lack of nourishment. It may be better to assist the mother by partially feeding the child, while allowing it to take what the mother can supply.

Diet and General Care to Promote Nursing.—Much can be done to help the mother to nurse her child by regulating her diet. Milk should be the basis of her food, combined with preparations of wheat, strained oatmeal, or fine hominy. An abundance of cooked fruit is of great advantage. Fresh soft-boiled eggs, cocoa, freshly made English breakfast tea, and vegetables containing sugar, such as corn and beets, are all useful. The amount of meat to be taken will depend upon the mother's exercise and the quality of the milk. If the milk is rich in fat, it may be well to lessen the quantity of sugars and starches taken, and to add chicken, lamb,

and occasionally beef to the diet. If the milk is rich in protein and poor in fats, meat is not required, but sugar and starches should be taken. An abundance of water is most necessary. The patient must avoid overloading the stomach, and hence it is best to take a moderate quantity of food four times a day rather than three heavy meals.

There has long been a belief that acid foods produce colic in the infant. This depends entirely upon whether the patient digests the acid food completely. Some patients can eat grape-fruit, cold slaw, and pickles without disturbing the nursing child, while other patients cannot use vinegar in salad dressing without producing colic. As a rule, very sour food should not be taken. Any indigestible food will surely disturb the child. Patients must avoid such substances, especially those which are highly spiced.

Alcohol is not needed by a nursing mother, as it is transmitted to the child to its injury. Preparations of malt are useful with some women if they are digested, but many cannot assimilate them, and their use results in disturbing mother and child.

Many patients are unwilling to modify their diet to promote nursing, but those who have the patience to do so will often succeed, although at the beginning the outlook may be unpromising.

A nursing patient should not become chilled or greatly overheated or excessively fatigued. Any healthful moderate exercise is beneficial.

Patients often inquire whether when nursing a child they can indulge in sea-bathing. This depends upon the temperature of the water and of the air, whether the patient is accustomed to sea-bathing, and especially upon

the effect which sea-bathing produces. If a patient is chilled, depressed, and weakened by it, it will do harm. If it is refreshing and improves the appetite and sleep, it does good. Nursing patients should not expose themselves to heavy seas, nor should they, as a rule, dive or jump from a high point. Ordinarily, swimming or bathing in still water is often beneficial.

The effect of sudden and strong emotion, especially anger and grief, is very pronounced and harmful to a nursing patient. Such changes in the milk are sometimes produced as to make the child violently ill. Where a nursing patient has a great mental shock, as the sudden death of a near relative, or an accident, the child should not be allowed to nurse until she has recovered somewhat from the shock.

Milk should be extracted from the breast by a pump at a time when the child would otherwise have nursed. One of the essentials for successful nursing is that the mother shall be spared nervous shock and disturbance as far as possible.

Feeding and Nursing.—In these cases the best results are obtained by having the mother nurse during the night and early morning. When she is at rest a quantity of milk sufficient for several meals for the child will accumulate, and her rest at night must be taken advantage of for this purpose. Milk for the child should be prepared in the forenoon, and if the mother nurses the infant during the night and in the early morning a fresh supply of cows' milk will be ready to supplement the mother's nursing.

Prescription of Food for Infants.—*It must be distinctly remembered that it is not the part of a trained*

nurse to prescribe food for an infant. Those persons who know least about the subject are usually most ready to advise a mother as to what food she shall give her child. Proprietary foods abound and are widely advertised. The trained nurse must absolutely decline to recommend any form of food whatsoever if she wishes to retain the confidence of the medical profession. The physician should prescribe the food as he would prescribe medicine, giving written or printed directions for its preparation, and these orders the nurse must follow.

Dilution of Cows' Milk.—The nurse can assist the physician very much by correcting certain impressions which parents are very likely to have concerning infant feeding. Persons are very apt to assert that cows' milk prepared for infant feeding is too thin and weak to nourish the child. They do not see breast milk under ordinary circumstances, as it passes at once from the mother to the child. They observe the dilution of cows' milk to a high degree, and reason that the milk is too poor to support the child. This objection should be met by explaining that the mother's milk is also very dilute, and that it contains but 3 or 4 per cent. of fat, and 7 per cent. of milk-sugar, and between 1 and 2 per cent. of albuminoid material. The dilution of cows' milk is necessary to make it like the milk of the mother, for naturally cows' milk contains more albuminoid material than does that of the mother.

Cleanliness with Milk.—The necessity for absolute cleanliness with milk employed for artificial feeding is not always appreciated by parents and caretakers. The nurse may explain that in the case of the nursing infant the milk passes so directly from the mother to the child that germs do not gain access to it. If the cow could be milked directly into the child's mouth, there

would be very little danger that germs would gain access to the child's stomach through feeding with cows' milk ; but as this is usually impossible, care is necessary.

Preparation of Milk.—In mixed feeding, physicians often prefer to use cows' milk partially digested. Materials for peptonizing and pancreatizing milk are furnished for this purpose, and printed directions are given for this process. In peptonizing and pancreatizing milk care must be taken that the milk is not bitter. If it is heated too long with the ferment, digestion goes so far that compounds are formed which in the body are produced in the small intestine. These compounds are very soluble, but bitter and unpleasant to the taste. Peptonized or pancreatized milk must be heated as short a time as possible to bring it to the change desired. It then remains perfectly sweet and agreeable to the taste. In mixed feeding only milk and milk mixtures are necessary, as the child is too young for some of the articles of food which may be used to advantage later. The nurse will obtain from the physician precise directions regarding the preparation of the milk, and these must be conscientiously followed. Such directions usually include the care of the bottles and nipples.

Physicians often ask patients to use "top milk" in preparing food for infants. By this is meant the top layer of milk served in pint or quart bottles. If the quality of milk be good, this represents from 10 to 16 per cent. fat, and is equivalent to the ordinary cream obtained by rising. With vigorous children this is usually satisfactory, but with delicate children and those whose digestions are difficult to satisfy, cream of definite percentage should be employed rather than top milk.

Cream obtained by rising is considered 16 per cent.

fat. By using separators cream containing from 16 to 30 per cent. fat can be obtained. Physicians are accustomed to designate the amount of fat required, and to order cream of definite percentage.

Bottles.—In selecting bottles the nurse must choose those of medium size with rounded surfaces, and having short necks upon which a rubber nipple may conveniently be placed. Under no circumstances should a bottle having a rubber tube and nipple be employed. Round bottles of medium size are very convenient, as the child can grasp them better when taking its food. Bottles must be cleansed by boiling in a solution of sodium bicarbonate, rinsing thoroughly with boiled water, and keeping in a saturated solution of boric acid. A brush for cleansing bottles can be obtained at milk laboratories or at house-furnishing shops. If a bottle becomes coated with a layer of albuminoid material, it may be necessary to employ a strong alkali or at times to use shot in cleaning the bottle.

Nipples.—The best quality of black rubber nipples should be obtained, and care should be taken that the holes of the nipples are not too large. The nipples should be turned inside out to be cleaned with soap and water. They may also be boiled, and should be kept in boric-acid solution when not in use.

Weaning.—By weaning is understood the removal of the child from the mother's nourishment so that it is fed entirely without her assistance. The decision to take so important a step as weaning a child must always be made by the physician in attendance, as it entails great responsibility. This is a critical time for both the mother and the child.

Weaning may be done by entirely ceasing the nursing

of the child or by continuing partially to nurse and partially to feed it. When it is possible to do so the latter is usually chosen. If weaning is made necessary because the mother's milk fails, she will usually not have much trouble from distention of the breasts. If, however, weaning is done because the milk disagrees with the infant, milk may continue to form abundantly and the mother may suffer much discomfort. The nurse must always watch the condition of the breasts at weaning, and by the practice of massage, by the use of a supporting bandage, and by relieving the breast partially with the pump she may prevent serious inconvenience. Restriction of the mother's diet for a few days will also assist much in checking the secretion of milk. In weaning it is usually found sufficient to thoroughly cleanse the breasts and to bandage them smoothly, and allow them to remain undisturbed. Fluids should be omitted as much as possible from the mother's diet, and saline purgation will often help to check the secretion of milk. If considerable pain be present, lead-water and laudanum may be applied, as already described. Nurses should do all in their power to discourage the weaning of an infant, unless it be done upon the advice of a physician. In some cases the mother does not desire the trouble of nursing the child. In others, she is too much occupied with other affairs, and dislikes the regularity and care which nursing brings. She should not, however, bring a child into the world unless she is prepared to do this duty for her offspring.

The artificial feeding of an infant is a matter in which the faithful and intelligent co-operation of the nurse is of the utmost importance. In her own field she can do quite as much as the physician to bring about the suc-

cessful growth of the child. She must necessarily have the confidence of the mother as well as that of the physician.

Composition and Care of Cows' Milk.—As milk is the food usually chosen, the nurse must know something of the composition and care of milk. The milk of cows is usually selected for infant feeding. In some cases the milk of goats or of asses is chosen as being more easily digested. At the present time there are in many cities of the country milk laboratories which furnish milk from herds especially fed and kept for this purpose. These laboratories also prepare milk in accordance with the doctor's directions, and send it to the houses of patients. While the preparation of milk at the laboratory is a most valuable thing, there are many families who cannot afford it, and who turn to the trained nurse for assistance in the care of the child. People often purchase milk at the laboratory and have the nurse prepare the milk at the house of the patient. The milk furnished by the Walker-Gordon Laboratories is the best milk available in nearly all cases. If this cannot be procured, the mixed milk coming from several sound, healthy cows of ordinary breed, fed on clean pasture, should be selected. It is well to avoid fine breeds of cattle, as the milk is often excessively fat, and such cattle easily become tuberculous. Good milk, like good wine, when poured into a glass and the glass tipped to one side should leave a distinct film on the empty side of the glass. Sound cows' milk is neutral or but very slightly acid or alkaline in reaction, has the characteristic odor of fresh milk, and has a dense white color. If put aside in a cool place, the fat rises to the top and forms cream. Cream ordinarily obtained by rising from a good quality of milk is

reckoned at from 12 to 16 per cent. of fat. If cream be purchased as separator cream or centrifugal cream, it should contain at least 20 per cent. of fat. Some physicians prefer to employ one kind of cream, and others, the other. The physician must specify whether he wishes cream obtained by rising to be used or that obtained by the separator. The best milk is served to customers in glass jars or bottles containing a pint or a quart, tightly sealed. So soon as milk is obtained at the house it should be put upon ice, and under no circumstances should a bottle be opened unless the entire contents of the bottle or jar are to be used. If only part of the contents of the bottle is required, the remainder must be used in cooking, when it can be boiled or scalded.

Mixing and Pasteurizing or Sterilizing Milk.— To keep and prepare milk properly for a child, the nurse must have exclusive charge of the refrigerator in which the milk is kept. Nothing but milk should be kept in this refrigerator. For this purpose what are known as nursery refrigerators, or sometimes travelling refrigerators, are very convenient. Such is a small block tin or zinc box containing a compartment for ice and one for bottles of milk. The melting of the ice is provided for by a suitable drain-pan. The refrigerator can be locked, and is of convenient size for use in travelling. In addition to a nursery refrigerator, apparatus for Pasteurizing or sterilizing milk must be at hand. The Arnold sterilizer is familiar to all nurses, and answers the purpose conveniently (Fig. 84). The Walker-Gordon Laboratory sells a sterilizer of excellent construction and convenient shape, fitted for the use of a thermometer, so that the degree of heat can be accurately known. From the laboratory or from a reliable druggist milk-sugar must be obtained in

convenient quantities, lime-water, and litmus paper. The physician may write his formula in tablespoonfuls, or he may designate ounces and fractions. If the latter, the nurse must have a graduated ounce measure. Brushes for cleaning the bottles, bottles and nipples, as already described, must be procured. The nurse will require a vessel holding from one to two pints, which can be kept exclusively for the purpose of mixing the milk and of such a character that it can be made absolutely clean. Some physicians prefer that the nurse should use a definite measure for milk-sugar, while others allow the use of the ordinary teaspoon.

The physician will prescribe that the child should have so many ounces of such a mixture at certain intervals. Multiplying the number of ounces in each feeding by the number of feedings, the nurse ascertains readily the total amount required. It is well to provide one or two extra bottles, as one bottle may become broken or the child may take a little from it and refuse the rest, and the milk cannot be used. The physician must distinctly state whether he does or does not wish the milk to be boiled before it is taken. It is usual at present not to heat milk beyond the point of scalding it for a few moments. This is practically Pasteurizing the milk. Strictly speaking, heating the milk to 167° F. for six minutes is termed Pasteurizing it. To sterilize milk, it is brought to the boiling-point, 212° F., and continued at this point for a varying time. Some have milk boiled one-half hour, others but twenty minutes. It is seldom necessary to prepare milk but once in twenty-four hours. If the milk be perfectly sound, and the nurse is absolutely clean with the utensils employed, and if the ice-chest be a good one and absolutely clean, Pasteurized milk will keep readily

for twenty-four hours or more. Sterilized milk will keep much longer. In the majority of cases Pasteurized milk is preferred, because sterilized milk does not always nourish the child. Where pure, sound milk, in good condition, can be obtained, it requires no Pasteurizing or sterilizing. The quality of the milk, however, must be positively known.

To prepare the quantity of milk required for twenty-four hours, the nurse must ascertain from the doctor's orders the amounts of milk, cream, lime-water, sugar of milk, and sterilized water required. These various ingredients, taken from clean vessels, should be mixed in a porcelain or earthen or agate vessel which has been cleansed by boiling. The whole quantity so prepared should then be put through a glass funnel into the number of bottles selected, so that each bottle contains the number of ounces of the mixture to be taken at each meal. The bottles are then to be corked with cotton which has been made sterile by baking or steaming. The bottles are then placed upon ice until time for feeding.

If the physician desires the milk to be Pasteurized or sterilized, the bottles are put in a sterilizer or in a pan of water upon a fire, and the milk is treated in the manner designated. After it has been Pasteurized or sterilized the bottles are placed upon ice, and when a bottle is required it is taken from the ice and warmed in a basin of water until it feels slightly warm to the hand, the cotton stopper is removed, and a nipple taken from the boric-acid solution is placed upon the bottle. It is then given to the child to nurse. For warming a bottle at night a suitable apparatus can be procured at any house-furnishing shop, which can be placed upon a gas fixture. There are also cups heated by electricity for warming milk,

which are very convenient. They can be connected by a wire with an electric light. It is often most useful to employ this during the day, as the nurse may not have access to a range or stove. By scrupulous cleanliness and aseptic precautions on the part of the nurse very much can be done to provide proper nutrition for the child.

Emergency Feeding.—Cases sometimes arise in which the advice of a competent physician cannot be immediately obtained. Under such circumstances the nurse must do as well as possible for the infant until a physician can arrive. The nurse may find use for the following directions:

The milk should be as pure as possible. The cream should have been obtained by rising. To prepare the food, ascertain first how many bottles are required. Estimating the number of ounces which may be required at a feeding to be three, and the number of feedings in twenty-four hours to be ten, this will provide an excess of food, as usually but two ounces will be taken at a time, and but eight or nine feedings in twenty-four hours. It is best to prepare one quart of food at a time. Mix the entire quantity in a perfectly clean vessel; then place in the nursing bottles the number of ounces required for each feeding. Cork the bottles with sterile cotton, place them in a pan of water so that the water rises from one-third to one-half of the height of the bottle, and scald the milk contained in the nursing bottles. To do this, the water in the pan must boil and the milk must come to a simmer. So soon as this happens the milk must be taken from the fire.

The bottles should then be kept upon ice until the milk is required, when the milk should be heated by dip-

ping it in hot water to a gentle heat. The cotton plug may then be removed, a clean rubber nipple placed upon the bottle, and the child may take its food from the bottle. To make one quart of food for an average healthy infant the following may be used:

Milk,	$2\frac{3}{4}$ ounces.
Cream,	$5\frac{1}{4}$ "
Lime-water,	$1\frac{1}{2}$ "
Milk-sugar,	$1\frac{1}{2}$ "
Water to make	1 quart.

For a premature or feeble child, the following may be used:

Milk,	$1\frac{3}{8}$ ounces.
Cream,	$2\frac{5}{8}$ "
Lime-water,	$1\frac{1}{2}$ "
Milk-sugar,	1 ounce.
Water to make	1 quart.

The nurse in charge of an infant should obtain from the physician in the case precise directions for the composition of its food. These directions are given only to assist nurses where medical attendance cannot at once be obtained.

Gruels.—In addition to milk prepared under precise directions, predigested milk is often used. Physicians may dilute milk with barley-water or oatmeal-water. The nurse must be able to prepare either of these in a suitable manner.

In making either barley-water or oatmeal-water the best quality of meal or grain should be obtained, and should be boiled until completely and very thoroughly

softened. It is not desired that the infant should obtain any of the harder or irritating portions of the grain. Accordingly it must be made much softer than when eaten by adults. The gruel should be strained through sterile cheesecloth or gauze, and the fluid so obtained may be used to dilute the child's milk. This may be added to a bottle containing milk, cream, lime-water, and milk-sugar without making an unpalatable mixture.

Beef-juice.—Beef-juice is sometimes added to the bottle of a young child, or in cases of illness may be given to the child instead of milk. It is prepared by selecting a good piece of steak, broiling it on both sides quickly before a hot fire, and then squeezing the juice with a lemon-squeezer. Children sometimes take this better when a little salt is added to it. White-of-egg water is prepared by beating up the white of a fresh egg with four to six ounces of pure water. This may be sweetened with sugar of milk to an agreeable taste.

Medicines and Proprietary Foods.—Medicines are sometimes added to the child's bottle. In such cases the nurse must be careful to follow the exact doses prescribed, and to watch for the effects of these remedies. Patented foods are largely manufactured and advertised, and are claimed to take the place of any other form of nourishment. *Under no circumstances should a nurse use or advise the employment of one of these preparations.* Such responsibility must be taken by the doctor only.

Feeding without Bottle.—Cases are sometimes seen in which it is almost impossible to induce the child to nurse through a bottle. Food must then be given by a medicine-dropper or by a spoon. It is hard to maintain strict asepsis with such feeding, but the nurse can at least be absolutely clean, and this is often sufficient.

Colic.—Nurses must be cautioned to avoid giving to children mixtures for colic. Various teas, whiskey, brandy, peppermint, gin, hot water, cold water, sugar, salt, and various other substances are given to nursing children to relieve colic. In the absence of medical attendance the nurse should content herself with emptying the child's rectum with an injection of warm soapsuds, and with giving the child water as hot as it will take it, to which are added a few drops of essence of peppermint. Further treatment should come from the physician.

Record of Feeding.—It is a great convenienee to a physician in treating an artificially fed child if the nurse will record the number of feedings and the amount of food actually taken. In this way an accurate idea is gained of the amount of nourishment which the child is really obtaining.

Infant's Stools.—Nurses should be familiar with the appearance of the stools in breast-fed and artificially fed infants. In healthy breast-fed children, when digestion has become established, the stools are bright yellow, two or three in twenty-four hours, and the consistence of a soft paste. When the infant is fed upon cows' milk the stools are lighter in color, thick, and more tenacious. Sometimes a distinct curd can be seen. If the nurse will take a couple of bits of stick, she can tease out the curds and gain a good idea of their toughness and firmness. The healthy infant's discharges are neutral or slightly acid. If strong acidity be present, or if the stools are markedly alkaline in reaction, some disorder of digestion is present. Should the stools be green with mucus, blood, or pus, the nurse must report at once to the physician. A healthy infant has from one to three stools daily.

Indigestion.—Both nursing and artificially fed infants are very often troubled with colic and indigestion. This is shown by crying, distention of the abdomen, and discharges of gas from the intestine or from the mouth. Few infants escape a little colic during their early days. Should this continue the attention of the physician must be drawn to it as indicating some disagreement of the child's food or some abnormal condition of its bowels. To relieve simple colic, the child should be laid upon its stomach against a warm object. Hot water and peppermint, as already described, may be given. A rectal injection of warm soapsuds or of one ounce of warm sweet oil may also be used. The nurse must not be deceived in imagining that the child has colic because it cries. Its diaper may be wet, or a pin or some portion of its clothing may be irritating the skin. Thirst is often mistaken for colic, and several teaspoonfuls of water will often cause a crying child to be quiet. Gentle massage of the abdomen is very useful in these cases to aid the expulsion of gas.

The Child's Habits.—It is often necessary to form proper habits of eating and sleeping in the infant. The usual tendency of the newborn infant is to sleep during the day and remain awake during the night. This must be broken up by waking the child during the day at regular intervals and feeding it. It should be fed at night at its regular time only; and if it be made comfortable and given plenty of water, it may be allowed to cry for a time until it learns that it will not be taken up.

Constipation or Diarrhea.—The nurse must report to the physician the occurrence of constipation or diarrhea in the infant. A perfectly healthy child may have but one bowel movement in twenty-four hours, and that a

normal one. Most infants have two movements in twenty-four hours, and occasionally three. It is not the number, but the character of the movements which makes them of especial importance. In cases of chronic constipation in infants the doctor will prescribe appropriate remedies. The nurse may use to advantage rectal injections of warm sweet oil, with massage of the intestine after the morning bath.

CHAPTER XV.

CARE OF PREMATURELY BORN CHILDREN.

PREGNANCY may be interrupted accidentally, or it may be necessary to bring on labor to save the life of the mother or child. Prematurely born children require especial care and very close attention. The most premature child that has been successfully raised was born after a gestation of twenty-six weeks. Usually, however, a child must be seven or eight months advanced to survive.

The dangers to which prematurely born children are exposed arise in the sudden change of temperature from the mother's womb to the external world, and in the difficulty in digestion which the feebleness of the child produces. When it is seen that the pregnancy is to terminate prematurely, artificial warm shelter for the child must be prepared and arrangements made to feed it.

Incubation.—Incubators are chambers, or boxes, kept at a comparatively high temperature, in which prematurely born children may be kept until they are sufficiently vigorous to endure the ordinary temperature. Some of these are elaborate, with metal frames and glass sides, containing apparatus for heating and circulating water to maintain the temperature, and also having apparatus to inject oxygen gas or oxygenated air. These are interesting as scientific instruments, but are not of much practical importance. A simple and useful incubator is modelled after a French apparatus, and has been found

practically satisfactory. It consists of a wooden box having a glass lid which can be removed. About one-fourth of the distance from the bottom of the box is a false bottom or berth, which covers three-fourths of the floor of the box. Beneath this berth or false bottom are placed cans or bottles containing hot water. They are

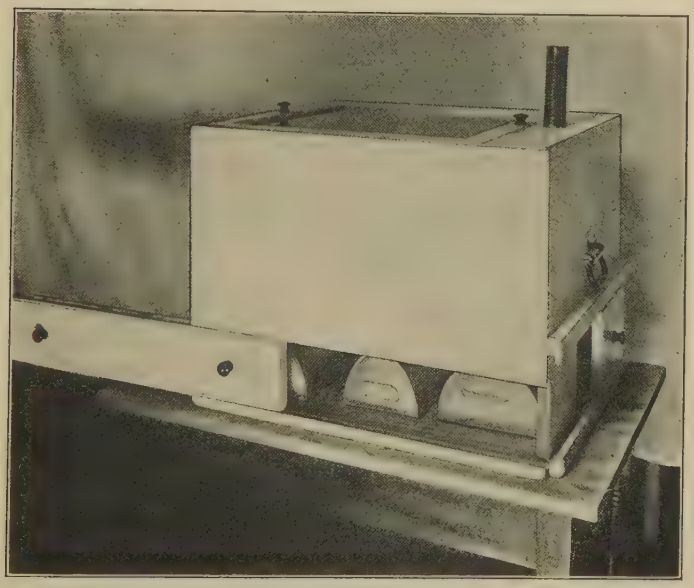


FIG. 65.—Incubator.

introduced by drawing back a slide which covers the space between the bottom of the box and the berth. At one end is a square opening or air window, which may be wholly or partly covered by a slide. At one corner of the upper surface of the incubator is a tube to permit the escape of the heated air. A bed is made upon the false bottom with a blanket or pillow, and the child is placed upon this. The hot cans or bottles are put in the space in the bottom, the air window is opened, air enters

at the bottom, passing over the hot bottles, and escapes at the top through the air tube. A thermometer placed beneath the glass lid enables the nurse to read the temperature of the interior of the incubator. Such a simple apparatus costs but little, and the usual degrees of temperature required are readily obtained by re-filling one of the bottles or cans at hourly intervals.

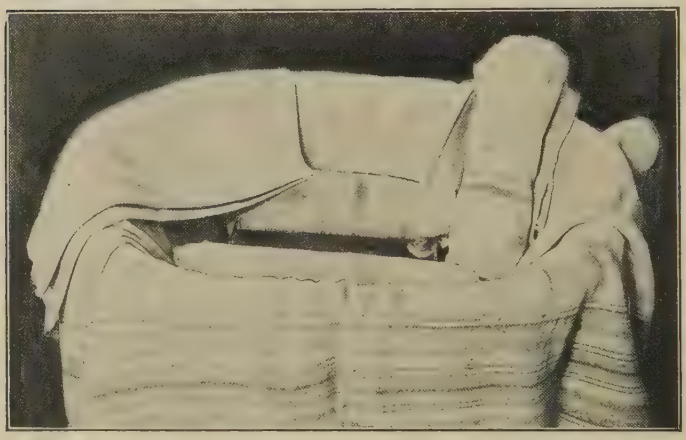


FIG. 66.—Clothes-basket incubator.

When it is not convenient to obtain an incubator an excellent substitute is found in the ordinary clothes-basket, in the bottom of which hot cans or hot bottles may be placed, two or more rolls of blankets being put around the cans to make a floor, and to keep the child from coming in contact with the cans. A blanket should be so unfolded as to line the basket completely, and the child placed upon a thickly folded blanket, with its head slightly higher than the feet. Other heated cans or bottles may be placed between the basket and the blanket which lines it, and thus the child may be kept thoroughly

warm. The advantage of the clothes-basket lies in the fact that the child can readily obtain an abundance of air, and in the ease with which it may be improvised.

Fresh Air.—It is very important that the premature infant shall obtain abundant air no matter what apparatus is employed. The incubator or basket should never be placed upon the floor, but upon a table three or four feet above the floor. This is more convenient for the nurse, and gives the child a much better circulation of air. If the weather be cold, the basket should be placed in a room with an open fire, and the room should be freely ventilated. The doctor should prescribe the degree of temperature at which he wishes the child to be kept. This will range from 95° to 85° F. in the majority of cases.

Dressing the Child.—While it is of the greatest importance that artificial heat be supplied for the child, the most careful arrangements in this regard may be defeated by a little careless exposure. When a premature child is born it should at once be taken before an open fire, wrapped in blankets, and after it has breathed well it should be thoroughly oiled with sterile olive oil. The vernix caseosa and oil should be removed by rubbing the child's body with sterile cotton. If the scalp and face be soiled, they may be quickly sponged with warm sterile water and quickly dried. The child should then be bandaged in thin carded lambs' wool, a layer of from one-half inch to an inch thick being placed about the body and limbs, leaving the orifice of the excretory organs without covering. This wool should be held in place by bandages of cheesecloth, which are very light and very easily adjusted. A very thin flannel slip may then be placed on the child, although this is in most cases unnecessary. Premature infants which move and

cry vigorously and promise to do well, may not be bandaged, but put in a flannel bag tied at the bottom. This permits free motion. Over the orifice of the bladder and bowel a handful of sterile cotton or wool should be placed. The child should be laid in the incubator, and should not be removed without the doctor's orders.

Feeding.—When it is necessary to feed such a child the mother's breast should be pumped or exhausted by pressure and the milk placed in a small cup in a basin of warm water. It should be taken at once to the child and dropped into the child's mouth from a medicine-dropper. Where it is difficult to feed a premature infant, milk may be taken from the mother's breast, placed in a small cup or glass in a basin of warm water, and if it cannot swallow, the milk may be introduced into its stomach by passing a small catheter into the stomach and pouring the milk through a funnel attached to the catheter. At times where there is difficulty in introducing the tube through the mouth, it may be introduced through the nose. Occasionally, nurses become very proficient in the use of a small feeding-cup with a spout, which enables them to introduce the milk far back in the throat. The doctor should prescribe the number of drams or drops which should be given, and the intervals of administration. Where the mother has no nourishment for the child or where her milk is slow in forming, the doctor will prescribe other nourishment for it. Predigested milk diluted with barley-water is often employed for this purpose.

Stimulation and General Care.—Prematurely born children usually require stimulation. The physician will order the kind of stimulus and the dose, and this is best administered considerably diluted. Thus the child will obtain its nourishment, drink, and stimulation

at regular intervals. The discharges from the bladder and bowels are received upon the sterile cotton or gauze placed between the thighs and beneath the child, and this should be removed and the parts thoroughly dried with sterile cotton as often as necessary. By close attention it is possible to keep such an infant clean and in a thoroughly sound condition. Should the child become uneasy the room may be warmed, the lid of the incubator removed, or the blanket covering the basket, and the bandages and wool removed gradually, the child's skin inspected, again rubbed with oil, and the wool and bandages replaced. The child should not be taken from the incubator if it can possibly be avoided. It is interesting to notice that such children cry but little, and seem more comfortable than children in the usual condition. This is probably due to their freedom from disturbance. When the temperature falls below the point of comfort the child will immediately cry. Should the temperature be too high the child will breathe rapidly and seem oppressed.

It is especially advantageous to premature children if they can have sun baths. These are of course useful only in the colder months of the year and on days when the sun shines brightly. It is better not to undress the child completely, but to allow its body to be covered with one thickness of light flannel. Care should be taken to protect the eyes by a bandage or cap. It will do the child no harm to sleep during the sun bath.

Premature children often have attacks of dyspnea and syncope, with very bad color of the face, which are extremely grave. Oxygen for inhalation should be kept in readiness for these cases, and in addition to other treatment ordered by the physician, oxygen may be inhaled. The nurse should allow the child to inhale oxygen. To accomplish this a mouth-piece or face-mask will be needed.

Such children should not be bathed in a tub until they have come to the full period of maturity, and have firmly established their health and vigor. They may be kept clean by sponge bathing when they are sufficiently strong. If care is taken to massage the breasts, and to use a breast-pump regularly and gently, the mother will usually have a sufficient supply of milk. It is difficult to know the weight of the smallest child prematurely born which has survived. In the writer's experience, twin children, one weighing a trifle over three and the other two and three-quarters pounds, have developed into remarkably healthy children. In this case the smaller child was dressed in doll's clothing for some time, as the ordinary infant's clothing was much too large. These children were kept in an incubator for nearly six weeks after birth.

Inunctions and Massage.—Much can be done to aid the development and nutrition of premature children by thorough, gentle, general massage with inunctions with various easily absorbed fats. A combination of two parts olive oil and one part alcohol; or sterile cocoa-butter; or cod-liver oil, to which has been added one teaspoonful of aromatic spirits of ammonia to two ounces of cod-liver oil, is useful for this purpose.

The hands of the person who gives the massage should be thoroughly washed in hot water before the treatment, and the fat used should be warm and soft. The child's entire body should be gone over thoroughly, not omitting the head and face. The muscles should be kneaded gently, and the limbs and joints moved to bring out the different groups of muscles. The excess of fat which is not absorbed should be removed with sterile cotton.

Of the different preparations advised, cod-liver oil is objectionable to many by reason of its odor, and olive oil or cocoa-butter is usually selected.

CHAPTER XVI.

DISORDERS OF INFANCY.

CONSTIPATION.

Infants may be much annoyed by constipation, and the condition may become difficult to remedy. It must not be allowed to continue, because straining and difficult defecation may bring about prolapse of the bowel and much suffering result. The constipation of an infant is a relative and not an absolute condition. Children have remained in perfect health who had but one bowel movement in two days. This, however, is the exception and not the rule. When the movements are hard, tough, and resisting when one examines them, and when the matter is ejected with difficulty, the child straining and crying during defecation, the condition demands active relief. The physician will see that the food is of proper quality and quantity. If the child be nursing, he may order a change in the diet of the mother. It is usual to employ a diet composed largely of vegetables, selected fruits, cereals, with a moderate quantity of sweet material and very little meat.

Abdominal Massage.—The nurse in such a case is often directed to give the child abdominal massage after the morning bath. The child is placed upon its back upon a blanket or upon the flannel bathing-apron; the nurse's hands must be warm and clean, and the hand which is to be applied to the abdomen should be lubri-

cated with sterile olive oil. The rubbing should begin at the lower portion of the right side of the abdomen, and follow the course of the large intestine up upon the right side, across just above the umbilicus, and down upon the left side. This manipulation is usually very agreeable to the child, and will sometimes cause an attack of colic to cease. The pressure should be a gentle one, and the manipulation may be continued from ten to twenty minutes.

Suppositories and Injections.—Suppositories of various kinds are ordered for the constipation of infants. Soap-stick is a suppository made by whittling a piece of soap into a convenient shape, when it may be slightly moistened with warm water and introduced within the intestine. The objection to soap-stick is the fact that soap is irritating to the mucous membrane of the bowel in some cases. Gluten suppositories dipped in olive oil are less irritating than soap-stick. Glycerin suppositories are made of small size for infant's use, and are preferred by some. Nurses are often directed to inject into the bowel in these cases an ounce of warm olive oil. The best syringe for this purpose is what is called the infant's enema syringe, a moderately firm ball of rubber and a short nozzle. If a piston syringe is used, care must be taken that but little force is employed. A Davidson syringe should not be used. It is practically impossible to introduce oil by means of a fountain-syringe. If soap-and-water enemas are prescribed, the nurse must watch carefully for signs of irritation in the mucous membrane of the bowel. Some children bear soap-and-water enemas very badly. The injection of glycerin is not often practised with infants.

Medicines.—Laxative medicines are used with infants

as with adults. The dose must be accurately prescribed by the physician, and also the time of administration. It will be remembered that infants take oils of various kinds without very much difficulty as a rule. Syrups are also easily taken, while bitter drugs and pills are given with difficulty. Powders combined with sugar of milk may be placed upon the tongue and will be swallowed without difficulty.

Habits.—The nurse may render the child great service by forming habits of regularity in the movements of the bowels. Morning and night should be the rule in infants, and if this be once established the adult will profit by it in later life. Constipation often shows itself by restlessness and fretfulness at night. If the attention of the physician be called to this, he will usually permit the nurse to empty the child's bowel just before the usual hour for putting it to bed. In this way discomfort is avoided during the night to both mother and child. Nurses must not forget that the free use of water is as necessary in avoiding constipation with infants as in adults.

DISORDERS OF THE MOUTH AND GUMS.

The mouth of the healthy infant should be clean and the mucous membrane a pinkish red. In certain portions of the mouth there are tissues which when normal in color are pearly gray. These can be distinguished, however, from patches of membrane or ulcers upon the mucous membrane. The child's mouth may be infected and bacteria may grow and multiply within its cavity.

Thrush.—Thrush, or sprue, is the growth of a fungus upon the tongue and the mucous membrane of the mouth. It forms in white patches of greater or lesser extent,

which can be removed by gently rubbing the part with soft linen. While this is not a serious condition as regards life, it is annoying to the child, and should large quantities of this fungus be swallowed the child's stomach and bowels might become disordered as the result. In the treatment of this condition the physician will prescribe a simple antiseptic. This may be applied in spray or by the finger, using bits of soft linen wet in the solution. Sometimes the child is given such a drug in combination with a sweet substance and permitted to swallow it. When treating such a condition the nurse must be very careful to be gentle. The mucous membrane of the mouth is delicate, and if the nurse is rough or careless in her manipulations she may wound the delicate tissue and give rise to absorption and to ulceration. Apparatus used for the treatment of such a condition should be sterilized by boiling at frequent intervals. If strict asepsis be practised under good treatment, the condition usually disappears. It is much less common with patients in whom the nipple is carefully cleansed, and where the child is not permitted to lie with the nipple in its mouth or to nurse too frequently.

Other germs than thrush may affect the infant's mouth. The gonococcus may cause ulceration or inflammation, and germs of sepsis may be present. Yellow spots with very red tissue around them, or patches of grayish membrane, indicate dangerous conditions, and must be immediately reported to the physician. A bleeding tendency of the mouth and gums is occasionally observed in infants. This is a serious matter, and should immediately be reported to the physician in charge. The gums are dark, swollen, and purplish, and bleed to the slightest touch. In other cases the gums are not swollen,

but are dark red, and the blood seems to ooze from them without apparent cause. Septic infection may be present in these cases, and aseptic precautions must be taken in the care of the child's mouth and of the mother's nipple.

Dentition.—Parents are usually much interested in the possible presence or coming of teeth. Infants are sometimes born with one or two teeth. In one case under the writer's observation it was necessary to remove with hemostatic forceps a small incisor tooth which gave the mother great pain when the child nursed. It is not usual for teeth to begin to make their appearance until the child is six or seven months old. The teeth are formed in the jaw in little cavities or nests. If the child is exceedingly well developed, the teeth will begin to work their way gradually up to the gum two months or more before the actual coming through of the teeth. If the child is in a perfectly normal condition, this will occasion practically no discomfort. In healthy children teeth come imperceptibly. If, however, the child is ill nourished, excessively nervous, and badly cared for, the coming of the teeth often occasions much disturbance and distress. The nurse should explain to the parents the usual course of dentition, and thus relieve them of unnecessary anxiety.

DISEASES OF THE LUNGS IN INFANTS.

Infants may have diseases of the lungs, as well as disorders of the digestive organs. Very rapid and labored breathing, with a harsh sensation conveyed to the fingers when laid upon the chest, fever, wide dilatation of the nostrils, a pale and bluish color of the face, are symptoms of the most usual form of pneumonia in infants. In some cases this disorder may arise within a few days after

the birth of the child, from the entrance of septic matter into the air-passages during labor. After prolonged and difficult labor the child may develop a serious or fatal pulmonary condition caused by pressure in the birth-canal. This is usually attended by rapid breathing, partial or complete unconsciousness, and finally by convulsions.

In pulmonary diseases of infants the physician will order stimulating treatment. The nurse must be careful to administer stimulants with as great regularity as possible. Alcohol and some form of ammonia are the substances usually employed. When sedative medicine is ordered the nurse must watch with especial care that the child does not become depressed under its use. Weakness, failing breathing, and increase in pallor should be detected and reported at once. It is difficult to feed infants with pulmonary disorders, and sometimes milk feeding must be abandoned, and broth, beef-juice, or dilute gruel used instead. Rectal feeding is sometimes employed, and also the administration of stimulants by the bowel.

It is of the utmost importance in treating pulmonary diseases of infants that the child should have a constant and free supply of fresh air. In cold weather such patients should be kept, if possible, in a room heated and ventilated by an open fire. Care should be taken that the air is not exhausted by burning gas jets or by dry furnace heat.

If the child has considerable fever, the room need not be above 60° F. in temperature. The direct inhalation of oxygen is of great use in many of these cases. To be efficient this must be taken through a small mask which completely covers the face. Paroxysms of coughing are

often controlled in this way, and the child's general condition greatly improved. In using oxygen with infants it is necessary to let the gas escape from the cylinder very slowly and gently, as otherwise the child is often frightened by the sound and impact of the oxygen.

External Applications.—An important part of the treatment of lung diseases in infants consists in external applications. These may be hot or cold, the latter being usually employed. A useful method consists in soaking a piece of loose flannel, wide enough to extend from the umbilicus to the throat, in water at a temperature prescribed by the physician, wringing it moderately dry, sprinkling it with spirits of turpentine, spirits of camphor, or alcohol, as ordered by the physician, and wrapping it about the child. Over this is placed one thickness only of thin flannel. In some cases no outer thickness is used. The nurse should watch the child under this treatment, taking the temperature within one hour after the pack has been applied. It will usually be found that a reduction of from one to two degrees has occurred. Should this not be the case, it is usual to order the pack to be renewed, using water at a lower degree of temperature. In some cases, in addition to the pack, an ice-bag is placed over the back between the shoulder-blades for additional effect.

In children who are treated in this way the nurse must take additional precautions to avoid shock. The temperature of the pack must be that prescribed by the physician in charge, and it is customary to order stimulants, to be taken at the time of the pack.

In addition to the applications already described, **simple counter-irritant applications** are often made. These usually consist of some combination of oil

with a counter-irritant which can be applied by gentle but deep friction. Olive oil (three parts) and spirits of turpentine (one part); amber oil; chloroform liniment (one part) and olive oil (two parts); and camphorated oil are some of the applications ordered. The front and back of the child's chest are rubbed gently but thoroughly with the preparation, and a loose light flannel is pinned about the chest.

In critical cases an infant is sometimes placed in a **bath** or in a **body pack.** The use of baths or external applications, especially if they be cold, may occasion alarm to the mother, and cause her to fear that the child will suffer from shock. The nurse will usually be able by tact and kindness to show her that her fears are unnecessary.

SEPTIC INFECTION IN INFANTS.

Children are sometimes attacked with septic infection derived from the mother's blood before birth or by contact with some septic object. The umbilicus may ulcerate, being wholly or partially covered with a yellowish-gray deposit; there may be ulcers in the mouth and about the anus or the genital organs. Dark-reddish spots beneath the skin and oozing of bloody fluid from the mouth and bowel may also be present.

The nurse should at once report any of these symptoms to the attending physician. If the umbilicus be infected, he will prescribe local antiseptic treatment, which must be carried out with care and regularity. In cases in which the blood is infected, and in which oozing of blood occurs, local treatment is of little avail. The nurse must keep the child strictly clean and be careful to irritate oozing and bleeding surfaces as little as possible.

WOUNDS AND INJURIES OF INFANTS.

After severe and prolonged labor the child may be born with the cranium distorted and the scalp bruised, or even wounded. After breech labor the upper portion of the child's body may be found injured. The pressure of forceps in difficult extraction may temporarily interfere with the nerves supplying the muscles of the face, and the face may be drawn to one side for a few days. One eye will often be swollen entirely, or partially shut for a short time after a difficult labor. Very rarely a fetal bone is broken during the labor. Recently the writer had under his care an infant born without medical assistance. The woman who was with the mother became frightened because the hand of the child appeared at the side of the head during the birth. Seizing the hand, the woman made strong traction upon the arm, breaking it.

The nurse may comfort the mother with the information that swelling and bruising of the cranium will rapidly disappear after the first few days of life. Unless deep, wounds and scratches require usually no dressing.

They should be sponged with sterile water when the child is washed, and allowed to dry thoroughly. A small scab of serum and blood will usually form, which is an efficient and useful dressing. Should injuries be severe, aseptic dressings must be applied. Antiseptics should be used with great care in infants, lest absorption and poisoning result. In cases of fracture the physician will fit proper splints carefully padded and held in place with cheesecloth bandages. It is sometimes necessary to use the child's body as a splint, bandaging the child's arm

against the side. In such cases the child cannot be put in the tub until the fracture is united. Unless injuries be severe, infants usually recover with little or no deformity. The nurse should encourage anxious parents with this knowledge.

The skin of an infant is so sensitive that nurses must be cautioned in the use of external applications. A hot bottle or hot-water bag laid against the body of a new-born child, although several thicknesses of flannel intervened, has produced a severe burn. This is especially likely to happen if the child's body be wet or the flannel be damp. In using such applications nurses must be cautious to avoid injury.

BLEEDING FROM THE UMBILICUS; PROTRUDING UMBILICUS.

When **bleeding** occurs **from the umbilicus** the nurse may stop it for the moment by making pressure with sterile gauze at the point of bleeding. The physician must be immediately summoned. Hot water and antiseptic solutions must be in readiness. If the physician does not arrive promptly and pressure from a compress control the bleeding, the nurse may bandage a compress upon the umbilicus by a snugly fitting abdominal bandage. The case should not go, however, without the attendance of a physician.

After the umbilical cord separates the granulating surface at the umbilicus retracts, and a firm scar forms which effectually closes the umbilical ring. In some cases **granulations** form about the stump of the cord, and may bleed if irritated or touched by a dressing. The attention of the physician should be called to this state, when applications will be made to remedy the evil.

After the umbilicus has healed a **protrusion of the tissues** beneath the umbilical ring may occur. When the infant cries or coughs a tumor about as large as the end of the little finger is forced outward. If this be carried back by the tip of the little finger, a small ring can be felt, which is the contracting umbilical ring. To prevent this protrusion various sorts of pads and applications are used. A fairly efficient support is made by stitching sterile gauze into a pad an inch square. This is held in place by an abdominal binder of soft, elastic flannel. Where difficulty is experienced in retaining a pad or retentive dressing adhesive plaster may be used. If such is the case, the nurse must take care that when the adhesive strips are changed the child's skin beneath them is thoroughly cleansed with soap and water, and then with alcohol and water. Unless caution is exercised the skin may become sore. Circular pads cut from cardboard, coins covered with linen or surgeons' lint, or any smooth circular object may be tried as an appropriate support. The nurse may comfort the parents by informing them that few of these cases give rise to serious trouble or persist to adult life. When the case becomes chronic the doctor may prescribe a hard rubber truss, held in position by an abdominal bandage.

ERUPTIONS IN INFANTS.

During the first few weeks after birth eruptions of various sorts are sometimes observed among infants. A small bright-red eruption over almost the entire body sometimes follows cleansing of the skin, especially if the child be too warmly clothed. An eruption of small blisters is mildly contagious, and in neglected cases with weak children may become serious. This is usually

treated by the use of a very mild antiseptic powder or lotion. Chafing and excoriation about the genital organs and the anus are suggestive of constitutional taint, or result from neglect on the part of the nurse. If the diapers are not changed promptly and the child kept clean, such a condition readily arises. Irritating discharges from the bowels or bladder also form a cause. An eruption, at first dark red or brownish red, then fading to a copper color, is suggestive of constitutional disease, and must be at once reported to the attending physician. An eruption of dark, livid spots beneath the skin, becoming gradually larger, while the child has an abnormal temperature, with prostration and discharges of blood from the umbilicus, bowels, or mouth, is a serious symptom, and must be reported as soon as observed. Nurses must remember that dye-stuffs in cloth may produce eruptions in children. The application to the body of an infant of a cheap quality of red flannel wrung out of hot water has often produced a deceptive eruption. The bites of insects must also be kept in mind in these cases. Usually the simplest treatment possible is ordered, bathing with alcohol and water or with boric-acid solution, or the use of simple ointment. The responsibility of the nurse consists very largely in detecting and promptly reporting the occurrence of such an eruption.

CHAPTER XVII.

DISORDERS OF INFANCY (Continued).

OPHTHALMIA NEONATORUM.

By this is meant infection of the conjunctivæ in the eyes of infants resulting from the presence of a septic germ. The infective agent in many of these cases is the gonococcus, or germ causing gonorrhea. This is peculiarly virulent, and blindness occurs in many of these patients. Other septic germs may cause ophthalmia, but the results are not so serious as in gonorrheal infection. The signs of this disease are redness and swelling in the conjunctivæ, with the formation of pus, which accumulates in the corners of the eyes. The pus is usually thick and yellow in color. It is occasionally very thin, dark brown or reddish brown. When the child is recovering a whitish mucous secretion is often present.

Course and Results.—Unless the disorder be checked the inflammation spreads rapidly, the lids become swollen so that the eyes shut, the white of the eye becomes a bright and flaming red, the pupils are contracted, the discharge is a bright yellow, less thick and much more abundant, and the child frets and cries with distress, endeavoring to rub the eyes with the fingers. The inflammation goes on to the interior of the eye. The eyeball swells, and finally ulceration through some portion of the eye occurs, followed by shrink-

ing of the eyeball and entire loss of vision. In cases which do not go so far the anterior portion of the eye becomes clouded and partially opaque from scar-tissue. With this condition the child would have partial vision only. The rate at which this inflammation progresses depends upon the kind of germ which attacks the eyes and the vigor and strength of the infant. If the gonococcus is present and the child a feeble one, blindness may result in two or three days. If a germ not so virulent attacks a strong and healthy child and treatment be instituted, the inflammation will be checked in forty-eight hours. The complete cure of this condition requires several weeks in most cases.

Infection.—The nurse must remember that this is an active infection, and a particle of matter from the child's eyes introduced into her own will cause an active inflammation and may result in the loss of her sight. This matter, when introduced through a cut or pin prick into the finger, may set up a septic inflammation. If one eye only be infected, the other eye will become involved if the secretion passes from one to the other. The case must be treated then with promptness and with great care and thoroughness, to save the eyes of the child and to avoid danger to those who attend it.

Treatment.—Physicians usually employ the almost constant application of cold. Compresses the size of a half dollar are cut from surgeons' lint and laid upon a cake of ice placed in a pan or basin. The nurse sits with the child upon her lap or in a crib, applying ice compresses constantly. To remove the secretion from the eyes, douching or washing with an antiseptic fluid is employed. A saturated solution of boric acid, mer-

curic chlorid (1 : 8000), normal salt solution, and sterile water are the fluids most often required. Special care must be taken that these fluids are of the proper strength, as an error in this particular might cause serious damage to the eyes. The way of making these applications differs with different physicians. Some prefer irrigation, while others cause the fluid to be dropped into the eyes from a medicine-dropper. Of the two, the irrigation is much more efficient, and is seldom injurious when carefully done. The nurse requires a rubber sheet, a slop-jar, a fountain-syringe, a medicine-dropper, the solution or solutions ordered, several small bits of sterile gauze or cotton, and a little sterile oil or vaselin. The glass portion of the medicine-dropper is separated from the rubber bulb, and is placed in the tube of the fountain-syringe to act as a nozzle. When the fluid has been placed in the bag the latter is hung about four feet above the child. Having cleansed her hands thoroughly, the nurse spreads the rubber sheet upon her lap and takes the child with the infected eye lower than the uninfected eye. If the child lies upon its side, the posture will be the best for this application. The fluid is allowed to run from the inner angle of the eye over the lids, passing downward and outward. Secretion is soon washed away, and if the child does not open the eye the nurse must very gently separate the lids with the thumb and finger and wash the eye thoroughly. The eye must be washed in a careful manner so that absolutely no particle of secretion remains (Fig. 67). When this has been accomplished the eye should be dried with sterile cotton, and sterile olive oil or vaselin should be very lightly rubbed upon the

FIG. 67.—Irrigating infected eyes.

outer surface of the lids to prevent the discharge from accumulating and contaminating the lids. The intervals of irrigation must be as short as is consistent with the child's general condition. Every half hour or every hour, while the inflammation is active, is not too frequent, and is often followed by great benefit. If bichlorid solutions are used, physicians often order that irrigation with normal salt solution be practised immediately afterward. Nurses must take every precaution that the solution used does not spatter, as it might carry with it infected material.

In addition to irrigation, physicians make applications in some cases of strong antiseptic solutions for the rapid destruction of the infective germs—silver nitrate, 10 to 20 grains to the ounce, or argyrol. The physician will order the eye to be thoroughly cleansed by irrigation, and then separating the lids he will drop into the eye the silver solution. In other cases he may prefer to use a small, soft camel's-hair pencil, dipping it in the silver solution and painting the infected surfaces with it. This is usually neutralized afterward by pouring normal salt solution into the eye. Solutions are sometimes employed to dilate the pupil, and the nurse may be ordered to drop a certain dose into the eyes at regular intervals. In these cases she must note the condition of the pupil, and will thus be able to know that the medicine is having an effect.

The nurse will note that preparations of silver stain linen, and that the discoloration is very difficult to remove. Care must be taken in using these solutions that the child's clothing and bedding does not become stained.

Precautions.—Caution must be exercised that the secretions from the eyes or that irrigation fluid does not find its way into the mouth, ears, or nostrils. When both eyes are infected double labor falls upon the nurse. The inflammation is rarely of equal intensity and of equal duration, and hence the case is prolonged and trying. Whenever possible two or more nurses should be placed in charge of a case of ophthalmia. It is a physical impossibility for one nurse to continue the applications day and night. It is exceedingly important that treatment go on during the night, although it may not be so frequent as by day. A child will often sleep while compresses are placed upon the eyes, and in some cases irrigation but partially rouses the infant. The use of rubber gloves is advantageous for the nurse, as it diminishes the danger of infection. *If, while caring for such a patient, the nurse experiences redness, smarting, or swelling in her own eye, she must report at once to a physician for treatment.*

In children very badly nourished that are attacked with ophthalmia the destruction is sometimes very rapid. Perforation may occur, with the discharge of fluid from the chambers of the eye and the complete loss of vision. Under these circumstances the eye shrinks. In other cases the physician may find it necessary to remove the eye to lessen the danger to the other.

EARACHE.

Infants, by raising the head, crying, and rubbing the ear may complain of earache. This is always a serious symptom, and especially with young children. The nurse should remember to put nothing in the ear without the direct orders of a physician. He should be sum-

moned at once, and until he can prescribe the child should be turned upon its side, the affected ear resting upon a hot-water bottle covered with flannel or some other woollen material. If the doctor should order the nurse to syringe the ear, she must remember the necessity for gentleness. A small syringe composed of a hollow rubber ball with a soft-rubber tube is best for this purpose. The child must be laid with the affected ear lower than the other, the solution must be carefully and exactly prepared, and the stream of fluid should be directed against the wall of the canal of the ear, and not directly into the ear. Should anything come from the ear it must be reserved for examination by the physician.

Excruciating pain is sometimes caused by insects gaining access to the ear. At other times an accumulation of wax may bring about earache of a severe character. The nurse must remember, however, that she should not introduce anything within the ear without the doctor's orders. If an insect should get into the ear, it may be killed by dropping in warm, sterile olive oil.

FOREIGN BODIES IN THE EYE, NOSE, AND THROAT.

Infants sometimes insert a foreign body into the eye, nose, or throat, producing injury and great anxiety on the part of the parents. If the affected eye be bandaged with sterile gauze or cotton, the foreign body may work its way out. The child should be seen by a physician as soon as possible. If the child gets something into the air-passages and is choking, it should be grasped firmly by the thighs and hung head downward, and one hand should be placed beneath the forehead bending the head slightly back. A second person may strike the child between the shoulder-blades, when the foreign body will

usually come out. Under no circumstances should the nurse or caretaker thrust a finger or instrument into the nose or mouth, because by so doing the object may be driven further in. An infant may swallow a foreign body. This is often imagined when it does not really occur. Here again the nurse must take care not to interfere without the advice of a physician. Nothing can be done at once to remove the foreign body. It must remain until it is embedded into the feces, when the fecal matter and the foreign body can be removed by the administration of a suitable medicine. The temptation would be to at once give the child an enema or a purgative medicine, but this would only result in injury.

INTUSSUSCEPTION IN INFANTS.

The intestine in young children is especially liable to become occluded by having a portion of the gut slip into an adjacent part. This is known as intussusception. As a result, inflammation occurs; the bowels become adherent. Unless this is relieved peritonitis and septic infection will result, and death will follow. The exact cause of the accident is unknown. Children in whom the tissues are not firm and strongly developed are most likely to have it.

The symptoms of this condition are pain in the abdomen, vomiting, an effort to move the bowels, rapid increase in the pulse-rate, fever, enormous distention of the abdomen with gas, and ultimately unconsciousness and death. The first symptoms may be very slight, and may be mistaken for a trifling indigestion. The first impulse of the caretaker is to give the child a purgative or laxative medicine. This, however, would be a great mistake,

for the action of the medicine would cause the intestine to adhere more firmly, and increase the inflammation. Until a surgeon can see the child no effort should be made to move the bowels. The child should be given broth, soup, or peptonized milk in small quantities. If there is delay in obtaining surgical aid, and the child is suffering greatly, from five to ten drops of paregoric in a teaspoonful of water may be given. These cases should be brought to the attention of a surgeon as early as possible. The only other treatment consists in operation. Occasionally physicians obtain good results by giving enemas, or by copious lavage of the intestine.

MALFORMATIONS.

Infants are sometimes born so dreadfully malformed as to be called monsters. Fortunately such rarely survive. The nurse must take great care that the mother does not see such a child, and that as few people as possible should behold it. Exaggerated and cruel stories often arise in these cases. Lesser degrees of malformations are not uncommon, and often affect the health of the child very little. Such are harelip and cleft palate, curvatures of the limbs, rudimentary fingers and toes, birth-marks, imperforate anus, and phimosis. The nurse should not report or comment upon these, but let the mother find it out for herself, and allay her anxiety by the statement that such a condition can usually be cured. Should the anus not be open the child's bowels cannot move, and an operation must very soon be performed. The child will have distress, distended abdomen, with straining efforts to move the bowels. A physician must be notified and some form of operation undertaken.

Retention of Urine.—Difficulty in emptying the bladder sometimes occurs in male children from phimosis. When upon urination the foreskin becomes distended urine will be retained and undergo decomposition, setting up irritation and inflammation. The attention of the physician must be called to this, when he will separate adhesions or perform circumcision to relieve the difficulty. If adhesions are separated and the foreskin is stretched, it will be the duty of the nurse under the doctor's directions to apply a sterile or antiseptic oil once daily after drawing back the foreskin. She must also notice swelling or hemorrhage after the breaking up of adhesions or after the performance of circumcision.

Circumcision.—The operation of circumcision is done among Hebrews on the eighth day after the birth of the child. Antiseptic precautions are often not practised by Hebrew operators. With surgeons the operation is done under antisepsis. The nurse should prepare for this operation a small table upon which is a pillow covered by a rubber sheet. Several clean basins, hot water, brandy or whiskey, usually ether, antiseptic or sterile gauze, a clean nail-brush, mercuric-chlorid tablets, and old linen should be in readiness. If the child is several months old, and strong, the operator may administer ether or chloroform. Stitches are often taken during this operation, and the nurse may be required to thread the doctor's needles, as well as to supply him with gauze or cotton sponges. If stitches are not taken, hemorrhage is prevented by compressing the parts with a strip of sterile lint or gauze. This is wrapped about several times firmly, and over this is placed an antiseptic dressing with a T-bandage. In all cases in which stitches are taken the nurse should watch closely for hemorrhage for

the first twenty-four hours after the operation. The risk of bleeding is less if stitches are taken. Should hemorrhage occur, the doctor must be immediately summoned. Until he comes the nurse should apply pressure at the bleeding point. The physician will renew the dressing himself for the first day or two, and then may instruct the nurse to dress the parts. The nurse must prepare her hands carefully, making them aseptic, and apply ointment or solution as the doctor may order, using either a dressing composed of a strip of aseptic material or applying a broad piece of aseptic gauze with a T-bandage, in such a way that the child's clothing does not irritate the wounded surfaces. Strict cleanliness of the skin surrounding the site of operation should be maintained. If tact and gentleness are used in dressing these cases, they are not very difficult to manage. The nurse should send at once for the physician for hemorrhage, or great swelling with very dark color of the parts. If the child cannot empty the bladder freely, the physician must be summoned.

Among Hebrews it is not usual for a nurse to take any part in this operation, as it is a religious rite; hot water, stimulants, old linen, a covered pillow, and a small table or several chairs should be provided.

Dilatation.—When circumcision is not performed the physician will practise dilatation and retraction of the foreskin, with the application of oil or ointment. The nurse will be required to sterilize his probe or forceps, and to sterilize olive oil, which is most usually employed. The nurse should observe closely how the doctor retracts the parts, so that when she is ordered to do so she may perform this manipulation in the manner desired.

Competent physicians examine thoroughly each new-

born child to detect malformations or abnormalities which require treatment. In female children an irritating discharge from the vulva may be present, which may require the use of douches with a warm solution of boric acid or sterile water only. Slight curvatures of the legs may sometimes be corrected by judicious massage and pressure, and this the physician will instruct the nurse to do. If extra fingers and toes are small and easily detached, they will be ligated and removed. Birth-marks cannot be remedied without a more serious procedure, to be undertaken later.

Hare-lip and Cleft Palate.—By hare-lip is meant a failure of the two sides of the upper lip to join properly, leaving a triangular gap. By cleft palate we understand a failure of the bones which form the roof of the mouth to properly unite. Sometimes one of these is present without the other, but usually both are observed in the same patient. They form a distressing malformation, which interferes with the child's nursing or feeding; and if it lives to grow up, makes its speech disagreeable and indistinct. This condition is hereditary in many cases.

When such a child is born, the nurse should not allow the mother to see it, if possible, for the first twelve to twenty-four hours. This will give the mother time to recover from the fatigue of labor. She should then be told of the occurrence, and also informed that many of these cases are cured by operation when the child is a few months old. When the child attempts to nurse, difficulty may be experienced because it cannot close the lips properly around the nipple. Unfortunately, but little aid can be given in this; but by repeated efforts the child will usually improve in this respect. Where, however, the child cannot draw milk from the breast, or if

the milk does flow, it passes into the nose or wind-pipe, this will give rise to coughing and strangling, and may set up an infection of the lungs. It is often necessary in these cases to pump the mother's milk, and to feed the child by a pipet or medicine-dropper. If the milk be dropped far back in the mouth, and the child's head be suddenly but gently raised, the child can often swallow successfully. The mouth should be kept scrupulously clean in these cases, with boracic-acid solution to which a few drops of glycerin have been added. Where the deformity is very bad, it may be necessary to feed the child by a catheter or tube passed through the nostril into the stomach.

Operation upon the lip may be done successfully when the child is from three to six months old. This is often performed without an anesthetic, or under the influence of a very small quantity of chloroform. The repair of the palate is not usually attempted until the child is from eight to eighteen months old. After these operations especial care must be taken to keep the mouth thoroughly clean.

It is sometimes possible to very greatly improve cleft palate without a cutting operation. If the hands be thoroughly washed, and the thumb and finger of one hand be introduced into the child's mouth and placed at the posterior extremity of the upper jaw, and firm but gentle pressure be made directly toward the center of the mouth, the bones can be pressed together. This is but a temporary result, but if this be done daily for one or two months, considerable progress can be made. This manipulation causes the infant to cry in most cases vigorously, but it does not disturb the child's digestion, and may be carried out in spite of the child's cries. The nurse should en-

courage the mother to hope and believe that the child's condition can be greatly improved, or completely cured.

Mothers are often curious to know why such malformation occurs. While the matter is not perfectly clear, it cannot be traced, as a rule, to any one act on the part of the mother, nor can it be proven that anything which she saw during her pregnancy brought about this result. Malformation occurs through failure of the two halves of the skull to properly unite. The condition is hereditary in some families, but without known cause.

CHAPTER XVIII.

DISORDERS OF INFANCY (Continued).

HERNIA.

CONDITIONS arise with infants which result from congenital weakness or lack of development. Weakness at the umbilical or inguinal rings may cause the protrusion of the lining membrane of the abdomen or of the intestine, pushing the membrane before it. Umbilical hernia usually disappears spontaneously with the use of a simple pad. Inguinal hernia in one or both groins will not disappear without the use of a truss. Occasionally a pad can be fitted to an inguinal hernia which will give temporary relief, but this rarely becomes permanent. Great caution is necessary in using permanent trusses with infants lest injurious pressure be made and damage to the bowel result.

CYANOSIS.

When the valve between the chambers of the heart does not properly close the blood does not receive its needed supply of oxygen, and as a result the color of the child is bluish or cyanotic. Such a child breathes feebly, has a cold skin, and a peculiar bluish and livid appearance of the features. It is not likely to survive, although in some cases the child reaches the age of ten or fifteen. A slight cold or sudden exertion or nervous fit may destroy the life of the child. Such a child must be shielded in every possible way from injury and protected from extremes of heat and cold.

TONGUE-TIE.

Mothers are often annoyed by the belief that infants are tongue-tied. If the child can suck and nurses vigorously, there is no ground for this belief. Its powers of suction may be tried on a rubber nipple or upon the finger of a clean hand. It is occasionally necessary for a physician to cut the tissue which holds the tongue, and, as oozing may follow, the nurse should have at hand small pieces of ice and soft sterile linen.

CONSTITUTIONAL DISORDERS.

Rickets.—Infants may be born rachitic, inheriting the disease usually from the mother. In the most common variety the cranium only is affected, the dome of the skull being broader and thicker than normal. In severe cases the cranium, ribs, collar-bones, and long bones are also involved, the legs of the child are crooked, it is pigeon-breasted, the back is not straight, and the cranium is large and heavy. Such children are very liable to colds and pulmonary diseases, and to catarrh of the intestine. Their care requires thorough and patient nursing, with changes of climate and carefully selected food. Excessive sweating about the head is one of the distressing features from which these children suffer. They require sponging with alcohol at night, salt baths, massage, oil inunctions, with specially selected feeding. With such care it is usually possible to arrest the spread of the disease and to bring about at least a partial convalescence. For the correction of the limbs and alterations in the spine orthopedic apparatus is usually worn. While this must be adjusted by an orthopedic surgeon, it will be the duty of the nurse in charge

to see that the skin at points where the apparatus makes pressure is kept in sound and healthy condition.

Tuberculosis.—Under the name of scrofula, a condition characterized by chronic swelling and tubercular infection of the lymphatic glands, sluggish digestion, and impaired nervous system is sometimes observed in young children. Very rarely the swollen glands undergo suppuration. Pus forms and is evacuated, and the child wholly or partially recovers. In other cases the swelling in the glands disappears without suppuration. Nurses in charge of such children are required to give massage and to use salt bathing for the child, predigested and carefully prepared food, and to practise inunction with oil, and in some cases to rub into the enlarged glands medicated ointments. Like rickets, this disorder is usually brought to a partial recovery, although the child is rarely as strong and healthy as other children. In other cases the tubercular infection attacks the joints.

Hydrocephalus.—By hydrocephalus is understood a condition commonly called "water on the brain." The head of the child is considerably enlarged, the bones of the skull are abnormally wide apart from each other, there is unusual bulging at the fontanel, the child is weak and ill-developed in other ways, and in the most advanced grades of hydrocephalus the child is malformed in various portions of the body. Where the head is excessively large the physician in charge may be obliged to pierce the head before the child can be born. If such a child survives its birth, the tendency is for the skull to remain large and for the head gradually to increase in size after the child passes the first few months of life. In treating this condition a surgical procedure may be necessary. Thus the spinal canal or the cranium may be opened

under antiseptic precautions, and fluid allowed to escape. For this the nurse must have ready antiseptic dressings, antiseptics, stimulants, and the articles usually required for operations. Compression bandages are sometimes applied to the cranium, but usually without result.

Marasmus.—Under the name marasmus is described a condition of failing nutrition in infants in which they become exceedingly wasted, unable to digest and assimilate food, and finally perish from exhaustion. The abdomen is drawn in toward the spinal column, the child cries and whines almost incessantly while awake, and wasting is so extreme that the limbs resemble those of an animal or bird. The fat entirely disappears from the body and the skin covers the bones loosely. If this condition becomes pronounced, it is exceedingly difficult to correct. If the slightest variation from proper nutrition is quickly recognized and taken in hand, the child may be rescued from this danger. In the treatment of a marasmic infant the nurse will be asked to prepare predigested foods, to make soups and broths and other nutritious liquids, to use irrigation of the intestine, oil inunctions, massage, hypodermoclysis, and every means available to stimulate the vigor of the infant. If the case is taken very promptly and treated thoroughly, recovery sometimes follows. Unless these favorable circumstances are present the majority of such children perish.

PARASITES.

Infants are sometimes attacked by parasites, which cause them great annoyance and in some instances positive suffering. These may be derived from other children, or attendants, or from domestic animals. Dogs and cats have several diseases of the skin which they may trans-

mit to the human being. One of these is **ringworm.** This is a circular parasitic growth which takes its name from the shape formed by the colonies of parasites. Any domestic animal suspected of being the cause of the disease should be carefully examined and, if necessary, removed. The physician will order ointments and bathing with lotions to destroy the germ. Nurses must remember that their own hands and arms may be attacked by the same parasite.

The Itch Insect.—This insect is conveyed from one person to another by contact, and burrowing into the skin sets up an irritation which results in a pustular eruption. When placed under the microscope the itch insect is plainly discernible and the diagnosis is clear. The physician in charge will order germicidal ointments and lotions. Pustules must be opened and pus thoroughly washed out of inflamed areas of the skin. If germicides are then applied, the parasite is destroyed.

Bites of other insects, such as mosquitoes, flies, fleas, and other vermin, may produce in the skin of a delicate infant a severe and puzzling eruption. By careful observation the cause of the disorder can be detected and appropriate measures taken to prevent its recurrence. Very soothing lotions and mild ointments may be used as directed by the physician. In severe cases the child may become so irritated and may suffer so severely that considerable fever may result.

Intestinal Parasites.—As infants do not take the food from which many parasites are derived, we should not expect to find among them the same intestinal invaders which we find in the adult. What are known as thread-worms or seat-worms are occasionally seen in infants. As the name indicates, they are small white

threads found in masses or clumps in the lower bowel, and at the edge of the bowel where the mucous membrane joins the skin. They produce great irritation and itching, with mucous secretion from the bowel and general discomfort. In treating such a case the nurse would be ordered to wash out the bowel very thoroughly, and then to apply such lotion and ointment as the doctor will prescribe. While excessively annoying, they are not especially dangerous, and the nurse may comfort the mother and allay her apprehension.

JAUNDICE.

Certain variations in the child's physiologic processes sometimes occasion anxiety and call for attention. Jaundice is not uncommonly seen in newborn infants, appearing from the third to the fifth day after birth. The skin is a lemon-yellow or slightly darker, the discoloration including the entire body, and being especially noticeable in the eyes and face. The urine may be highly colored, and it is often found that the bowels have not moved freely, and that the stools still consist mostly of meconium. The child does not seem especially distressed or fretful, although in some cases the appetite is less than normal. The treatment of this condition as prescribed by the doctor consists in the administration of some appropriate medicine, and the use of irrigation of the bowels. Warm fluids are usually employed to wash out the intestine, but in some cases the temperature is brought down to 70°, 65°, or 60° F., so that the irrigation may be said to be cool. The condition usually disappears in the course of a week with good treatment.

ENLARGEMENT OF THE BREASTS.

For some unknown reason the breasts of newborn children become enlarged during the first two weeks after birth. A thin milky fluid may be present and considerable distention accompany it. It is usually necessary to do nothing for this condition, as it generally disappears in a few days. Should inflammation and suppuration occur, then the infected breast must be incised, and the abscess-cavity washed out thoroughly and drained under antiseptic precautions. Should the infant's breasts be greatly swollen, the swelling can often be controlled by the use of warm fomentations. Then soft flannel should be wrung out of water at a temperature of 100 to 110° F. Upon this should be sprinkled spirits of camphor. Some physicians prefer to make applications of belladonna ointment diluted with lanolin or white vaselin. Such applications should be kept in place by a smoothly applied and snugly fitting flannel bandage.

SUPPRESSION OF URINE.

Much alarm is sometimes felt from the statement that the child has passed no urine during the first forty-eight hours of its life. The correctness of such a statement is very hard to prove. When a child is placed in a warm tub-bath, urine is often passed while in the bath, and its presence is not detected. Unless the diapers are changed frequently and inspected, if the child's urine be not highly colored, the passage of water may not be observed.

If the nurse is convinced that the child has not passed urine, the doctor will dilate the urethra and pass a small

sound to see whether there is an obstacle to the passage of urine. If this is not the case, then medicinal means may be employed to establish the secretion. The use of warm fomentations over the back, the application of cloths wrung out of warm water over the bladder, the administration of medicines by the mouth, plenty of water for the child to drink, a warm tub-bath followed by massage, are all useful. The application of cloths wrung out of warm water and sprinkled with spirits of turpentine may be necessary to secure relief. It is almost impossible to collect the urine passed by an infant, hence we are usually without an accurate idea of the quantity really voided.

PERSISTENCE OF MECONIUM.

The child's bowel movements should become yellow in four or five days after its birth. When this does not happen and the movements remain dark and tar-like in appearance there is delay in emptying the intestine of its natural contents. The physician will prescribe proper laxatives, and the nurse may be asked to use lavage or injections into the bowel. Unless this condition is accompanied with jaundice, with great prostration and abnormal temperature, it is usually not a serious matter.

ECZEMA.

Under the name "salt rheum" parents are familiar with a rough, scaly condition of the skin, behind the ears or on the face, which gives the infant great distress. Eczema is most often seen in children who inherit some nervous peculiarity of digestion. There seems to be a curious relationship between the skin and the mucous

membrane of the bowels in these cases. The eruption is usually most irritating to the child, and it suffers from itching so severely that it will usually scratch the roughened surfaces until they bleed. The physician will prescribe not only a very careful selection of diet, but he will also order the use of ointments and lotions. In severe cases large areas of the body affected in this way must be protected by bandages. Thus if eczema be upon the scalp the child must wear a sort of night-cap, which will cover lint on which ointment is applied. If on the limbs, ointment is often spread upon surgeons' lint and kept in place over the affected part by cheese-cloth bandages. The nurse must be competent to apply these bandages and to make the necessary dressings as the doctor may order. The tendency of these patients is to improve as the child grows older. They are often of fair and delicate skin, and usually have fine complexions in later life.

SCALP-CRUSTS.

Upon the scalp of infants there is often seen a yellowish-white crust which mothers imagine comes from dried milk. Hence they are often termed "milk-crusts." They result from the accumulation of secretion from the oil-forming glands of the scalp, and require removal and proper care of the scalp afterward. The popular belief sometimes met with, that to remove them is dangerous to the child's brain, is absurd. The affected surfaces should be thoroughly rubbed with sterile oil. Sterile sweet oil or castor oil may be employed. If the crust is firm and large, this oil rubbing may be repeated several times at intervals of a few hours or at intervals of a

day. When the crust has become thoroughly softened the scalp should be lathered with very fine soft soap, using Castile or the purest quality of shaving-soap. If this is gently washed off with warm water, the scalp will be found to be clean. A saturated solution of boric acid or of borax should be employed until the tendency to form a crust ceases.

CONVULSIONS.

Infants are sometimes seized with convulsions, and this condition is called the eclampsia of the newborn. Such a condition usually comes from some point of great irritation in the intestines, mouth, the skin, the genital organs, or in the brain itself. The convulsions are but a symptom whose cause must be discovered. A nurse can do but little for a child in convulsions without medical advice. Should the doctor fail to arrive promptly, she may put the child in a warm bath, placing a cloth wrung out of cold water on its head, and she may move the bowels by a copious injection of warm water or weak Castile soapsuds. When the doctor arrives he will prescribe medicine to check the convulsions, and will endeavor to remove their cause. If the child be teething, it may be necessary to lance the gum. For this the nurse may be asked to hold the child's head, grasping it gently but firmly between her hands. She will often be asked to sit, taking the child upon her lap, holding its hands with one hand while she draws the head of the child against her chest with the other hand placed against the forehead. In this way she can usually control a young infant. After the gums are lanced, should bleeding be excessive ice is often applied, and a small bit of ice wrapped in an old clean handkerchief may be pressed

firmly against the bleeding point. Soft, clean linen dipped in whiskey or brandy is sometimes applied. In other cases the nurse will be asked to wash out the intestines very thoroughly, to remove decomposing food or intestinal secretions. If sedative medicines are given, the nurse must watch for their effect with special care, as children are susceptible to these drugs. Usually convulsions are indications of some serious condition, and require prompt and efficient treatment.

VACCINATION.

While it is not customary to vaccinate very young infants, under strict antiseptic precautions and with pure lymph it is possible to do so with very little discomfort to the child. Vaccination should be as absolutely aseptic as possible. We do not wish to destroy the action of the virus by antiseptics, but we very much fear lest we may introduce with the virus a germ which might bring about an inflammation. Vaccination should never be done with matter derived from a human being. Only lymph selected from sound young animals and thoroughly aseptic should be employed. Hence a nurse should never allow a crust from a baby's arm to be saved to use in vaccinating another person. The physician who performs the vaccination may do it upon either the arm or the leg. In the case of girls it is not uncommon to vaccinate upon the leg, to avoid the scar upon the arm. As the physician may direct, the site of vaccination should be made thoroughly clean and aseptic. The nurse should provide for him an antiseptic solution, hot water, soap, clean or sterile towels, and a new nail-brush.

The most successful vaccination at present is done by the use of lymph in sterile glycerin, put up in hermetically sealed tubes. Scarification is done with a sterile needle; the lymph is dropped upon the prepared surface and is rubbed in with the needle. After this has dried precautions must be taken to prevent the clothing of the infant from touching the vaccinated spot. Vaccine shields which adhere to the skin, forming a disc of felt, protecting the arm from the clothing, may be used if the physician recommends them. In some cases a shield is employed which is fastened about the arm or leg with tapes. The principle should be to protect the part inoculated from contact. The vesicle will usually form in successful vaccinations in from three to five or six days. If the vaccination has been done in a thoroughly aseptic manner, and if the lymph be pure, there is usually very little disturbance of the general health. The child may be a little fretful, or may take a little less than the usual amount of food, but in many cases even this cannot be noticed. The nurse must use all diligence to keep the vesicle from being broken, so that the lymph which it contains may dry into a firm, protecting crust. Under no circumstances should the crust be removed unless by the attending physician. If the vesicle bursts and lymph runs over the skin, physicians usually order the application of sterile dressings held in place by cheesecloth bandages or zinc oxid adhesive plaster. At the end of ten days, or before, the crust usually separates, making a whitish scar with a few depressions. Vaccination is commonly regarded as an unimportant and not especially dangerous affair. If it be done in the best manner possible, it very rarely causes illness or great discomfort. If it is performed, however, in a careless and dirty manner, it may bring about death.

CHAPTER XIX.

THE DEVELOPMENT OF THE CHILD.

Mothers and nurses are always intensely interested in the growth and development of the child. Each fully developed newborn child is on the average fifty centimeters, or twenty inches, long. The circumference of its chest and of the head bears a definite ratio to the length of the child's body. In cases in which well-marked disease is present this ratio is destroyed, and certain portions of the body are much larger than normal, while other portions are much reduced in size.

WEIGHT.

The average infant weighs from six and a half to seven and a half pounds at birth. Great variations from this average are sometimes seen, as in cases in which a child weighs ten or twelve pounds, or in which the weight is reduced to three or four pounds. During the first few days of life the child loses steadily in weight. This results from the discharge through the kidneys and intestines of matter which has been stored up in the body before the child was born. There is in the mother's milk not much nourishment for the first few days, and hence there is little or nothing to replace the loss. The child, however, does not require much, and so there is no need to interfere with the child by giving it cows' milk or various preparations. So long as its strength is

good and the mother's milk is forming naturally it is best not to interfere.

After the mother's milk has become established the child gains, and continues to gain steadily. The rate of this gain is from three to five ounces weekly on the average, or about a half ounce daily. This steady increase in weight is one of the best indications that the mother's milk agrees with the child, and that the child is normally developing. It is of great importance that the child be weighed at regular and frequent intervals. Nurses must impress this upon the minds of mothers and caretakers of children, for it is an exceedingly difficult thing to obtain a regular weight in the case of most children. So soon as the mother is up and about she forgets or neglects to weigh the child, and it is only when the child becomes ill that attention is drawn to the fact that it is deficient in weight and also in vigor. Suitable scales can be obtained especially designed for this purpose. It is not safe to trust to scales from grocers or other persons who sell goods, as the scales are not always accurate. In addition, it is very inconvenient to take an infant to be weighed, and the surroundings are not always clean and inviting The weight should be reported at regular intervals to the physician in charge and will be recorded by him. If the mother desires to keep a record, she can find books and charts for this purpose easily available. In weighing a child it is not always possible to weigh it without clothing, but the clothes can afterward be weighed and the result taken from the weight of the child when clothed. If the child ceases to gain in weight, the fact must be at once reported to the physician in charge.

LENGTH.

Infants grow in length as in weight. The average increase for the first six months is four inches in length. At birth the child's trunk is much longer than the limbs, but the limbs soon begin to grow and furnish the chief increase in the total length of the child. Growth in length occurs most markedly when some other physiologic changes take place. Thus after teething growth in length is often very noticeable. Infants sometimes increase in length much more rapidly than in weight. This fact need give no anxiety if the child remains strong and vigorous. Children inherit the peculiarities of parents in stature and weight. This naturally influences the way in which the child develops. Some babies are taller and thinner than others, but so long as the child maintains vigor, performs its functions normally, and is neither thin nor excessively fat there is no cause for alarm.

GENERAL DEVELOPMENT.

It is far more important that the child's flesh be firm and its muscles capable of vigorous action than that the child should be excessively fat. The fat and flabby infant is usually far from well. In such a child we should fear a delay in teething, or the gradual development of rickets or some other disease of the skeleton. We judge of the physical development of an infant by its weight, the firmness and elasticity of its flesh, its vigor, its color, and the evidences of physical happiness which it shows in the enjoyment of its food and sleep.

THE NERVOUS SYSTEM.

The growth of the nervous system of a child furnishes one of the most interesting and fascinating studies. At

birth the brain and spinal cord are simply two masses of sensitive matter, capable of receiving very delicate impressions and very easily excited by sensations. There is no evidence that the newborn infant thinks, remembers, perceives, or has emotions. Nervous reflexes are present which are as active as in the adult. The senses are capable of excitement, and by repeated sensations from the same source the child soon locates the source of its food and learns to recognize in a manner its caretaker. The first nervous action of an infant is recognition, caused by the regular repetition of certain very necessary things. From this it can readily be inferred how important it is that the feeding and care of the child be conducted with regularity. Inasmuch as the nervous system develops by the regular repetition of several things upon which the child's life depends, we may see that the formation of regular habits is the beginning of the training of the child's brain and nerves.

Parents usually recognize in a child evidences of intelligence before others can do so, or before there is good reason for believing that intelligence exists. Their belief should not be disturbed, however, as it does no harm and is to them a source of great interest and pleasure. Beyond the recognition of its food and caretaker the infant does not usually develop recognition until several months have passed.

The faculty of sight is that most commonly observed, and that in which most persons recognize the first beginning of intelligence. The eye of the child sees, but the brain does not perceive. Images of external objects are received upon the eye, but the brain is not sufficiently developed to know what these sensations mean. The child will usually follow with the eyes a bright or glitter-

ing object, turning its head as the object is moved. It is probable that the sense of sight is among the first which is developed, as our memories usually go back in childhood to something which was seen at that time. The sense of hearing does not seem to be developed promptly, nor does the olfactory sense, but the sense of taste, and the skin sense or touching sense, whereby the child appreciates cold or warmth, or rough or smooth surfaces, are early formed.

The Care of the Nerves.—In the development of the nervous system the obstetric nurse will find employment for her powers of observation and judgment from the natural interest and sympathy which she feels for mother and child. The nurse will find herself usually growing fond of the child, and this will be a natural encouragement for its growth. What may be termed a proper mental atmosphere is as necessary for a child as for the happiness of an adult. Children are quick to feel the presence of ill temper, neglect, abuse, or any disturbing influence. Those who cannot control themselves in the presence of the minor annoyances of life are not fitted to care for children. The nurse should remember that in forming proper habits for the child she is laying the foundation for its health and happiness. Her instinct will often guide her safely to appreciate its wants. There is no more interesting patient than a growing and developing infant, none which responds so quickly to good care, and none which does poorly so promptly as a growing child.

MOTION.

The first movements of an infant are apparently without purpose. The child's feet are prehensile as well as

the hands, and the child will endeavor to grasp a finger with the toes and often to pull itself up from the bed. In grasping the finger it gradually passes to seizing various articles presented to it. Such are usually carried to the mouth, especially if there be irritation of the gums through the formation or extrusion of teeth. The child moves its limbs frequently when placed upon its back upon a favorable surface. If turned upon the abdomen, the child will endeavor to raise its trunk, and will sometimes succeed in rolling over upon the back. Such exercise is very good for an infant, as it strengthens the muscles of the back.

As regards the child's creeping or walking, if placed upon a blanket upon the floor it may be allowed to do whatever its strength permits. There should be no object nearby which the child can pull itself up by to a sitting or standing posture. It is, however, dangerous for grown persons to set a young child upon its feet, for the weight of the body may be too much for the infant, causing the legs to bend. An infant can be taught oftentimes to use the hands by a little intelligent supervision, and thus dexterity can early be learned.

That **general condition** of the **nervous system** known as temper can be seen in infants, as some children are cross and fretful, petulant and annoying, while others are good tempered and pleasant. Infants inherit the nervous peculiarities of parents. Usually, however, an infant is agreeable in proportion as it is properly nourished and well cared for. Any evidence of nervous disturbance should call for an examination of its physical condition. Here again in the formation of a temper the nurse cannot be too careful to insist upon regularity with the child. The words "nervous" and "nervousness" should sel-

dom be used in speaking to mothers regarding their infants. It is a great misfortune for a child if it grows up under the expectation that it is to be a nervous child. In this connection the nurse will often have great difficulty in securing for the child freedom from intrusion. Those who visit the mother may desire to handle and inspect the child. It is quite customary to take an infant after it has been fed, and by jolting it violently and uttering loud and strange sounds to endeavor to soothe it to sleep. This disturbance the child resents by crying, and in the agitation its stomach is usually emptied of its last meal.

PERIODS OF DEVELOPMENT.

The development of a child is divided into periods which correspond with the various stages of nutrition present: The first is that which extends from birth until the coming of the first teeth. This is the period in which the child is usually, for some of the time at least, under the care of the obstetric nurse. During this time the child is without teeth, has little saliva, and its digestive organs are suitable for the digestion of milk only. The mistake of those who give to such infants foods and mixtures containing large quantities of starch and other substances not naturally found in milk must be evident. In mother's milk the child finds all the nourishment necessary for this period, and when the child lacks this it is reasonable to give it the closest possible substitute for mother's milk. The child will go through its normal gaining and develop naturally upon mother's milk or its perfect substitute. The nurse should impress upon the mother or caretaker that this is the case.

In the second period of nutrition the temporary teeth are coming. There is saliva in the mouth, and the child

may be fed with milk combined with jellies or gruels made of wheat, oats, or barley. Such jellies or gruels are greatly superior for the feeding of the infant to patented and prepared foods. They can be made by any intelligent person at very little cost. The third nutritive period extends during the time of the coming and going of the first temporary teeth to the gradual development and establishment of the more firm and permanent teeth. During this period the child is fed upon milk, gruels, soft egg, broths, soups, and a little of the mild and delicate sorts of meats, such as chicken, fish, or very tender beef. The duties of the obstetric nurse usually extend through the first period only, during the time of exclusive milk-feeding. She sometimes, however, has a child under observation through the first and second periods.

DENTITION.

At the sixth or seventh month it is usual for the first teeth to give evidence of their presence. These are the lower central incisors. Sometimes the upper central incisors appear at the same time or just before. The coming of a tooth occupies a considerable period before the tooth can actually be seen. A perfectly healthy child shows little or no evidence of what is taking place. It may put objects into the mouth very readily or suck its thumb more vigorously, or bite harder upon the mother's nipple or the nipple of the bottle. The mucous membrane of the gum grows paler in color, and if the finger be pressed firmly down upon the jaw the gum feels hard under the touch. The tooth is usually found accidentally, and no one recognizes the exact moment of its appearance. The next teeth after the lower central incisors are the upper central

incisors. They are usually expected at about the eighth to the twelfth month. At nine months the healthy child may have the following teeth protruding through the mucous membrane of the gums: two lower central incisors, four upper incisors.

The common belief that children must necessarily be sick and ailing when the teeth come is a very serious error. In well-developed and properly fed children it is usually impossible to note the coming of the tooth. If the child is ill fed, badly nourished, and excessively nervous, its bad health may be made worse and much more noticeable by the slight irritation of teething. When a child is getting its teeth in the first period and is fretful and ill, a physician must be sent for, who will thoroughly examine the child, and find some valid reason for the child's discomfort. If it be fed and properly cared for, the child will usually go on with its teething with but very little disturbance.

TO PROMOTE DEVELOPMENT.

A very interesting question arises, "What can the obstetric nurse do to promote the healthy growth and development of the child?" We believe that there is no more important part in the province of nursing than this, to aid in the establishment of sound health. This the nurse can greatly facilitate by regularity in the care of the child; by protecting it from unnecessary interference and from annoying and worrying attentions, and by strict cleanliness and neatness in every detail connected with the child. The keeping of a suitable record and the reporting at regular intervals of the performance of the child's functions and its normal growth are most important. Too much is often left to the nurse in this

regard, and if the child is apparently doing well the doctor does not ask for the information which he should have. His record should show the weekly weight and condition of each infant under his charge, with the character and composition of its food, and the details of any method of treatment employed. The nurse should teach the mother to weigh the child regularly and to keep the proper records and make the proper report.

CARE DURING TEETHING.

During the time when the coming of teeth is apprehended the nurse must remember to be strictly careful that nothing which is unclean gains access to the child's mouth. If the gums are swollen and sensitive, a spray of cool or cold water is often a great comfort. Where a tooth can be detected beneath the gum, if the finger be thoroughly washed and dipped in ice water, the child will usually allow the nurse to rub very gently but firmly down upon the point of the coming tooth. Sometimes a bit of ice wrapped in soft, clean old linen may be used to make gentle pressure for a short time upon the swollen gum. Physicians sometimes prescribe lotions or other applications which the nurse may apply upon the tip of the finger or upon soft linen in accordance with his directions. Usually very simple precautions are all that are required to keep the mouth in good condition during this time. Sometimes children have excessive fluid in the mouth at the coming of the teeth, and this is best remedied by pinning about the neck bibs or clean handkerchiefs, to keep the underclothing neat.

EXERCISE AND AIR.

The muscular development of an infant can best be promoted by the nurse by the regular bathing of the

child, with massage after the morning bath. Abundant fresh air, suitable clothing, and in addition to this proper food, are most necessary. Young children during the winter should not be taken upon the streets, but may be aired in an upper room by clothing the child properly and then opening the windows of the room. In mild weather the child should be out of doors as much as possible. Where sunshine can fall upon the child it is most advantageous. Nurseries should be sunny, clean rooms, with abundant ventilation and without plumbing connecting with the sewer. If a carriage is available, the child may go out in the nurse's arms during proper weather. Its own baby-coach may be used in yards and upon piazzas with the child suitably clad. The clothing should be so arranged as not to interfere in any degree with the child's movements. Skirts should not go much below the feet, as few skirts as possible should be worn, and the child should be encouraged to move its limbs. Nurses are often obliged to overcome strong prejudice against fresh air on the part of mothers, as they fear lest the child should take cold. They should remember that the absence of fresh air and the resulting weakness which follows easily predispose an infant to taking cold and to disease of the lungs.

PART II.

GYNECOLOGIC NURSING.

INTRODUCTION.

DEFINITION.

THIS branch of nursing has to do with those conditions of ill health in women in which the pelvic organs are concerned, but in which disease does not arise from pregnancy, parturition, or the puerperal state. As the majority of diseases among women are connected with pregnancy or parturition, it will be seen that the field of gynecologic nursing is a narrow one. As much of the treatment employed is of a surgical nature, it is more a surgical specialty than a separate and distinct department of medicine.

CAUSES OF DISEASE.

In many cases of disease among women some constitutional disorder inherited or acquired is the cause of ill health. Anemia or failure to excrete properly produces a depraved condition of the nervous system which makes natural functions painful in their performance. In other cases a distinct pathologic lesion is the cause of disease, as seen in tumors and foreign growths in the pelvis. In

other patients deformity or lack of development in the pelvic organs brings about ill health.

PECULIARITIES OF PATIENTS.

As many of these cases are chronic in nature and long continued, the disease exerts a profoundly depressing effect upon the patient's mind and disposition. Such patients are often melancholy and suffer severely from mental depression. Others are exceedingly nervous, timid, and apprehensive, exaggerating discomfort and suffering. In other cases, however, a patient endures for years considerable distress with surprisingly little complaint.

THE MANAGEMENT OF PATIENTS.

Nurses sometimes find these cases trying to care for, because of the mental depression of the patient. While it is difficult to satisfy fears and longings in many instances, still in others the nurse's services are highly appreciated and the patient coöperates most cheerfully in the treatment employed. The nurse must not be surprised at manifestations of hysteria, or any other of the abnormal actions which chronic nervous disease brings about. She must not be deceived by them; and while not offending her patient, she must take care to observe accurately the patient's symptoms and conditions. She must strictly preserve the patient's confidence, for many women excessively dislike to have the ailments peculiar to their sex narrated to other persons. In some cases, however, the patient becomes so mentally disordered that she delights in narrating the operations to which she may have been subjected. While the nurse may give comfort and encouragement by kindness and sympathy,

she must maintain especially her individual firmness and self-control. Obtaining clear and positive orders from the physician in charge, she must carry them out kindly but unflinchingly. She must respect the patient's delicacy of feeling in every possible way by avoiding unnecessary exposure and by showing uniform deference and civility. She must be absolutely clean in herself and in all objects which she uses about the patient. If she is business-like, methodic, and energetic, she will often find her difficulties much less than the querulous nature of the patient had led her to fear. A patient once remarked regarding a nurse, that when anything was to be done, the nurse went ahead and did it so promptly that the patient had not time to decide whether the treatment carried out was painful or distressing or depressing. This may serve as a useful hint in the management of these cases.

CHAPTER I.

THE EXAMINATION OF PATIENTS.

PREPARATION FOR EXAMINATION.

In all critical cases in which difficulty is experienced in arriving at a positive diagnosis the physician will have his patient prepared for an examination. The bladder and rectum should be emptied if necessary by catheter and by an enema. The patient's clothing must be so arranged that corsets and other constricting material are removed. One thickness of soft linen over the body seldom interferes with an examination and is usually more comfortable for the patient. As women are often apprehensive regarding examinations, the nurse should encourage the patient as much as possible that such a procedure need not be painful and should certainly not incur danger.

AN OFFICE EXAMINATION.

A complete and thorough examination of a gynecologic patient is best made in the office of a physician or at a hospital. At either place a suitable table is available which allows the patient to be put readily into various postures and where a good light, instruments, cotton or gauze are all at hand. Various tables are in use in physicians' offices which can be so turned upon one or other side or raised or lowered as to put the patient in various postures. The feet are supported in stirrups or foot-rests especially adapted to the purpose. In arrang-

ing a patient upon a table for examination the nurse should have at hand a clean sheet, half the size of the ordinary sheet for a double bed; to support the patient's head she should have several small and rather firm pillows. For some purposes the head must be placed higher than for others, and hence the need for several pillows. Tables are so arranged that the patient can step upon a foot-board and turning with her back to the table, the nurse can so lift the patient's skirts that they will be out of the way. The patient should then sit and then lie upon the table, assuming the posture which the nurse desires. She should be covered by the sheet during the examination. The physician will require the nurse to assist in putting the patient in various postures or to assist in manipulating the table as may be necessary.

Instruments.—Various instruments may be employed, and these must be prepared by washing them in soap and hot water, and placing them in an antiseptic solution, or by sterilizing them by boiling, as the physi-

FIG 68.—Retractor, speculum, tenaculum-forceps, scissors, scalpel, blunt scissors, dissecting-forceps, hemostats, needles, needle-forceps, gauze-forceps, curet. Description begins from left to right of picture.

cian may direct. Gynecologists usually have sterilizers in their offices in which instruments can quickly and readily be prepared. The nurse must be careful that solutions in which instruments are placed are warm, but that the instruments are not too hot.

Antiseptic Solutions.—Physicians often select antiseptic solutions which serve as lubricants as well. Among these, lysol is especially convenient in 1 per cent. solution. Others use warm Castile soapsuds, and others use hot water only, lubricating instruments with ointments prepared for the purpose.

Cotton or Gauze.—To wipe away secretion and cleanse parts for examination pledgets of cotton or small pieces of sterile gauze should be in readiness. There should also be a receptacle for these when soiled, and they should be burned as soon as possible after use.

Light.—In some physicians' offices a gas-light with a condensing lamp is available for examinations. In others a window impervious to observation is used. During such an examination it is the duty of the nurse to prepare the patient, place her in proper posture, to clean or sterilize the doctor's instruments, and to have at hand antiseptic solutions, lubricants, gauze or cotton as he may desire. In some cases a douche is given before an examination, and in other cases after the examination. When the physician is through with the patient the nurse must see that she has not been soiled by ointments or antiseptics used during the examination.

EXAMINATION IN PRIVATE HOUSES.

It is often impossible for a patient to go to the office of the physician, and it may be necessary to conduct the examination in the patient's house. The nurse must improvise for the purpose a table or so arrange a bed that it will be suitable for the patient's use. If a table is necessary, a clean kitchen-table covered with blankets and sheet is usually convenient. It should be so placed

that a good light will be available. As such a table is without supports for the feet, the nurse must rely upon the services of some one besides herself, or she may hold the patient's limbs while in the dorsal position by the use of a sheet folded in its longest way, passed about the patient's shoulders, and tied about the legs below the knees. If it is desired to raise the pelvis, folded blankets or a cushion may be placed beneath the hips of the patient, thus elevating the pelvis while the pillow is taken from beneath her head, allowing the shoulders and head to be low. If a bed is to be employed, it should be as high a bed as is available, the mattress should be firm, the covers should be removed from the bed, and the bed used as a table, the patient being covered with a sheet.

In a private house the clothing of the patient is readily arranged. A night-dress, dressing-wrapper, stockings, and slippers make a very convenient combination. Unless the physician orders an antiseptic solution to be in readiness, the nurse must rely upon hot water in abundance. Castile soap should be selected in preference to highly scented soaps. If a lubricant is required, olive oil may be used, or vaselin or cold cream. The latter, however, may have been employed for some domestic use, and hence are not usually as clean as olive oil. If the physician uses instruments in his examination, he may require several basins, the ordinary toilet basin being available for the purpose. If the physician does not bring gauze or cotton, and there is none available, the nurse may use old linen torn into small pieces and boiled if she has an opportunity to prepare it in this way. Before an examination the patient should be instructed to empty the bladder, and the bowels should have been emptied by medicine or by enema.

DESCRIPTION OF INSTRUMENTS FOR EXAMINATION.

Specula.—Specula are the instruments most commonly used for this purpose. They are adapted to open the birth-canal of the patient, giving opportunity to ex-

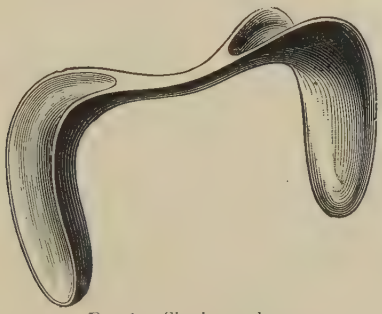


FIG. 69.—Sims' speculum.

amine the womb by sight. The speculum most commonly employed is Sims' (Fig. 69). This must be held by the

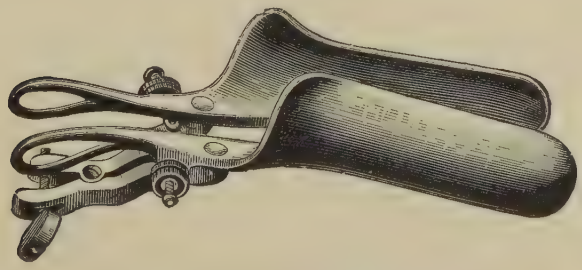


FIG. 70.—Bivalve speculum.

nurse or by the physician during the examination. Other specula are composed of two or more blades or portions so arranged that the instrument is introduced when closed, and the blades then opened to dilate the passage.

Other specula are arranged to be self-retaining by the attachment of a weight or small pail to receive douche-water or discharges. Occasionally cylindric specula are employed. Nickel-plated steel is the material of which specula are usually made. Such are tarnished by bichlorid solutions, but are not affected by carbolic acid, creolin, lysol, or boric acid. Aluminum specula are seldom used, and glass specula are very rarely employed. Hard rubber is sometimes used in making these instruments, but it has the objection that it cannot be boiled without becoming soft.

FIG. 71.—Edebohls' self-retaining speculum.

FIG. 72.—Fergusson's speculum.

In addition to specula, the physician may employ forceps for grasping the neck of the womb and drawing it down. These are tenaculum-forceps. They are of two blades, sharply pointed at the extremities and sometimes closing with a lock. Uterine dressing-forceps are also used, for wiping away discharges with gauze or cotton, or for making applications of medicines. Scissors are

needed in cutting gauze, and in rare cases in removing small bits of tissue for microscopic examination. When an examination is made of the kidneys and ureters catheters of various sizes are used. Piston-syringes or syringes especially constructed for withdrawing fluids from the kidneys, ureters, bladder, or uterus, are employed in some examinations. Specula especially designed for the rectum are frequently used, and resemble those constructed for the examination of the womb, but differ in size. Sounds or probes are sometimes, although not often, employed.

In some cases electric apparatus is used in such examinations. The electric light is exceedingly convenient for office use, and some forms of it have been especially adapted for the investigation of the bladder. Cystoscopes are instruments designed for examination of the bladder, and are cylindric metal instruments of graduated sizes.

EXAMINATIONS UNDER ETHER.

In doubtful cases in which especial difficulty attends a diagnosis it is customary to examine the patient under ether. The nurse who assists at such an examination should provide towels or napkins upon which the ether may be given, should care for the patient after the administration, should have ready what is necessary in case of vomiting, and should perform the duties which a nurse usually does in cases in which an anesthetic is given. While a nurse should not accept the responsibility of giving an anesthetic, she may if desired continue the administration of ether at the doctor's request after he has anesthetized the patient.

Duties of Office Nurse.—If a nurse has charge of a doctor's office and instruments, she must remember

the great necessity for absolute cleanliness with all instruments and appliances. It is usually best not to sterilize instruments for examination after they have been used, but to wash them very thoroughly with soap and hot water and to dry them very carefully. Jointed instruments should be taken apart and dried if possible. If the joints cannot be taken apart, the nurse may request the physician's permission to use sterile or carbolized oil or glycerin to prevent rusting and the accumulation of dirt. The nurse who has charge of office instruments should give the physician notice when instruments require repair or replating. Specula are readily injured, and may be ruined if the plating is not frequently renewed. Lysol is especially useful in disinfecting instruments, preserving their plating, and preventing them from rust. Well-made rubber articles are not attacked by lysol. Instruments should be boiled in 2 per cent. lysol to disinfect them thoroughly.

An office nurse is responsible for the office linen, which should be absolutely plain, of good quality, and perfectly clean and neat. She is also responsible for the cleanness of the examining-table, including its drawers and appliances, for the good condition of the sterilizing apparatus, the instruments and appliances, and for the good condition and sufficient quantity of the drugs or dressings used in examinations. But her duty will be half done if she confines herself to these points only. By the neatness and plainness of her uniform, including her cap, by her own exquisite neatness, and her quiet, sympathetic, and intelligent manner, she can very much lessen the influence of a trying ordeal for the patient. She must be skilful in avoiding discomfort and pain, and very discreet in her remarks. Under no circumstances

should she repeat knowledge gained while assisting a physician in the examination of a patient. As absolute quietude must be observed in some important cases, the nurse should avoid squeaky shoes and noisy clothes. It is well for her to wear felt slippers in office-work, and to have her clothing as little obtrusive as possible. As the physician will often examine the entire trunk of the body, he will listen to the heart, and would be much annoyed by a loud and disturbing noise.

CHAPTER II.

POSTURES OF THE PATIENT FOR EXAMINATION AND OPERATION.

DORSAL OR LITHOTOMY POSITION.

This is the most usual posture employed for pelvic examinations and for operations upon the cervix, vagina, pelvic floor, and perineum. The patient is placed upon the back at the edge of a bed or table. The feet may be

Fig. 73.—Improvised leg-holder with twisted sheet (Hirst).

allowed to rest upon the edge of the surface on which the patient is lying, or the legs and feet may be raised several feet from the bed. In the first position the patient may edge away from the examining physician by

pushing with her feet if the examination is painful. If the feet and legs are raised from the bed, she is not so likely to do this. To support the legs and feet when raised, two assistants may be employed, or a folded sheet may be passed behind the shoulders and tied around the legs (Fig. 73), or the feet and ankles may be supported by Edebohls' stirrups (Fig. 52). In some cases of dorsal position it may be desired to raise the pelvis, allowing the pelvic organs to gravitate downward and backward. This is accomplished by placing beneath the patient's hips and buttocks a folded blanket and sheet or a firm pillow. In all examinations the trunk of the patient should be free from constricting clothing and covered preferably by one thickness of linen. The thighs should be wrapped in towels or sheets, and the legs and feet covered by stockings. In hospital practice it is usual to employ leggings made especially for the purpose, which can be sterilized, and which are drawn over the feet, legs, and thighs.

SIMS' POSITION.

In this posture the patient is placed upon her left side, her right thigh and leg strongly flexed and carried upward and slightly forward, the left arm placed behind her, the head turned upon the left side. The hips and buttocks are at the edge of the bed or table. It is often best to use no pillow for the head in this posture, although if the patient prefers it she may use a low pillow (Fig. 51).

The object of Sims' position is to enable the physician to open the vagina readily with Sims' speculum, drawing back the pelvic floor and making the womb easy of access. To accomplish manipulations with the patient in

this posture, the nurse is required to hold the speculum after the physician has introduced it. She should stand with her back toward the patient's head, grasping the upper blade of the speculum with the right hand, taking care to hold it exactly as the physician directs. With the left hand she should raise the upper buttock of the patient, drawing it upward and backward. The nurse should be careful that she makes proper pressure with the point of

FIG. 74.—Sims' speculum, introduced and held by a nurse (Hirst).

the speculum which is internal. Unless caution is exercised, she may unconsciously allow the speculum to slip, defeating the doctor's efforts at examination. In Sims' position the patient's body and limbs may be covered in any convenient manner, it being necessary to expose only the region of the body to be investigated.

KNEE-CHEST POSITION.

In this posture the patient rests upon the knees and chest (Fig. 7). Her skirts should be raised above the knees, and she should then kneel upon the edge of the bed or table. She should then incline the body forward until the chest rests upon the bed, using a pillow if desired. Many patients when asked to assume this position attempt to lie flat upon the abdomen. This is incorrect, and the nurse must see that the patient keeps the thighs flexed and the pelvis high. With the patient in this posture the pelvic and abdominal viscera tend to gravitate upward and forward if the vagina be opened. To accomplish this, the physician may introduce a speculum admitting air, or he may draw the pelvic floor upward and backward by the finger. This position is much used in cases of backward displacement of the womb, in replacing the uterus and applying pessaries. The patient is often asked to assume this posture at night or morning. The nurse may be required to teach her the exact posture desired. The nurse must carefully place the patient in the correct posture, emphasizing the necessity for keeping the hips high and the chest low. In some cases the physician may ask the patient to introduce a tube into the vagina before assuming this posture, so that air may enter and the pelvic viscera move in the desired direction. With a little patience this posture may be assumed spontaneously by a patient and retained for from ten to twenty minutes.

TRENDELENBURG POSITION.

This posture is usually employed in abdominal section. It is rarely used in examinations under an anesthetic. In this posture the patient lies upon her back, her legs flexed

at a right angle with the thighs and hanging over the edge of the table. The table upon which the patient lies is then raised so that the hips of the patient are greatly elevated, while the head and shoulders remain low. The degree of elevation is varied with the needs of the case. To retain the patient in this position, the ankles and knees must be fastened to the foot of the table, while it is desirable that supports be employed for the shoulders. When the patient is placed upon the table her legs should be fastened to the lower or folding piece by several turns of a broad soft bandage. A loop of similar bandage should be passed about the ankles, and when the patient

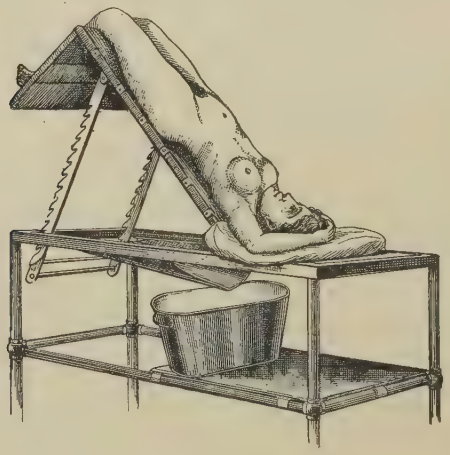


FIG. 75.—Trendelenburg position.

has been raised to the desired height this bandage should be fastened to the lower portion of the table. If these precautions are not taken, the patient may slip down during the operation, very seriously embarrassing the operator. To avoid injury to the knee-joints, the nurse

who places the patient in position must see that the legs are completely but easily bent over the edge of the table. Care must also be taken that the patient's arms do not drop down beneath the raised portion of the table. Cases are on record in which serious injury to the arms has resulted from such an accident. Care should also be exercised that the neck of the patient is not bent too sharply. The head must rest easily, turned upon one side, so that no obstruction to breathing is afforded. In using the Trendelenburg posture it is usually desired to vary the degree of elevation during the operation. In many tables adapted for the Trendelenburg posture shoulder braces are used to receive the weight of the patient and to avoid interference with breathing. Some tables are so arranged that the entire table may be raised at the foot whenever the operator chooses. To keep the patient from sliding down on the table, shoulder-pieces are used, and the patient's entire body can thus be readily inverted. The nurse in charge should make herself familiar with the workings of the table, so that she can raise or lower the patient quickly and without delay.

In an emergency when no table is available the Trendelenburg position may be improvised by using a large rocking-chair from which the legs and rockers have been taken. If the chair be turned over so that it rests upon the extremity of the back and the front edge of the seat, it forms an inclined plane upon which the patient may be placed. The chair must be covered with blankets to make the patient thoroughly comfortable.

Many tables arranged for the Trendelenburg posture have a drainage apparatus and pan in connection with them. The nurse should see that this is in order before the patient is placed in position, and that there is no obstacle to the proper flow of fluid.

STANDING POSITION.

Patients are occasionally examined while standing. One foot is to be raised and placed upon a stool or pile

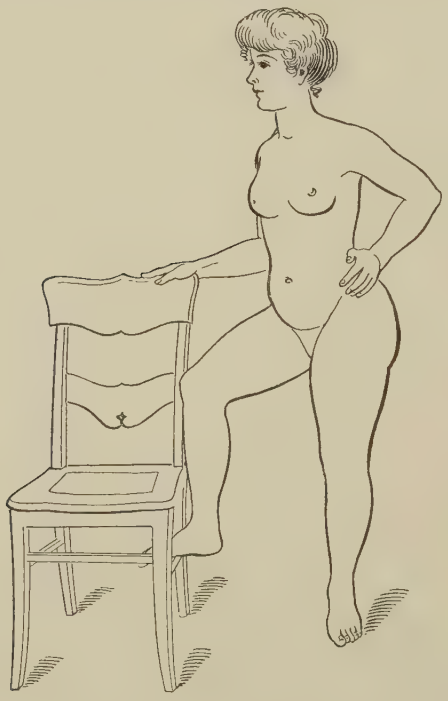


FIG. 76.—Erect position with the right foot resting on the round of a chair (Ashton).

of books, while the physician makes his examination. This posture is not often used, but may be required.

SQUATTING POSITION.

The patient is occasionally asked to assume the squatting posture, straining as if in the act of defecation. This is done to show prolapse of the walls of the vagina if such be present.

POSITION BENDING FORWARD.

It sometimes happens that the physician wishes to relax the anterior wall of the abdomen while the patient is in the sitting or standing posture. To do this, she places her hands upon the back of a chair placed in front of her, or upon the shoulders of a nurse, and leans the body strongly forward while either sitting or standing. The physician then palpates the abdomen with the abdominal walls relaxed by this posture.

CHAPTER III.

LOCAL TREATMENT.—PESSARIES.

LOCAL TREATMENT.

a *b*

FIG. 77.—*a*, uterine applicators; *b*, same in handle.

By this is meant the application to the womb or to the tissues about the vagina of medicines. Those most frequently employed are tincture of iodin, ichthyol, glycerin, boric acid in powder or solution, and occasionally calomel or some other form of mercury. These medicines are applied in ointments or in liquid form by means of absorbent cotton, in suppositories, or in capsules of gelatin placed within the vagina and allowed to melt. Such treatment is usually carried out at a doctor's office or at the house of a patient, when the assistance of a nurse may or may not be required for this work. Such treatment is much less practised now than formerly, as it has not proved very successful in the treatment of disease.

The nurse should prepare for such treatment the instruments required, which are a speculum, dressing-forceps, scissors, and applicators (Fig. 77). By the latter are meant thin rods of whalebone or metal, about which absorbent cotton in a thin sheet can be wrapped. This is then dipped into iodin or glycerin and carried into the

neck of the womb. These instruments should be sterilized by boiling, and placed in an antiseptic solution in a suitable tray ready for use. The nurse must also have ready a lubricant and clean towels, and a receptacle for soiled cotton, with small bits of sterile cotton or sterile gauze in abundance.

Posture.—The postures usually employed for this treatment are the dorsal and Sims'. The nurse should take care to protect the patient from soiling with medicines employed, by wrapping the limbs in towels or sheets, and by placing cotton or towels beneath the perineum. As some of the medicines used stain linen badly, the nurse must be careful that the patient's underclothing does not become soiled. Instruments employed in this treatment should be cleaned as soon as possible after use with a strong alkaline soap, to remove medicine which may adhere to them. Soiled cotton or gauze should be burned as soon as possible.

Tampon.—A tampon, or pledget, is a small mass of cotton, wool, or gauze inserted within the birth-canal, and allowed to remain there to make pressure or to convey medicine to produce a continuous action. To prepare a tampon, cotton or wool is formed into a sheet a half inch thick and several inches square, depending upon the size required. The tampon should be sufficiently small to pass readily through the speculum which the physician employs. The corners of the sheet of cotton or wool are then brought together, and the whole is twisted into a ball having the corners as a stem. About this stem soft white twine, sterilized by boiling, should be wound tightly several times and firmly tied. Such a tampon is dipped in glycerin or other medicine, introduced within the vagina, and allowed to remain. It

is removed by pulling upon the string, which should be left sufficiently long to have the end protrude slightly from the vagina. A tampon cannot remain in place very long without causing irritation and disease. Accordingly, the patient must be carefully instructed to remove the tampon at the time ordered. She must pull very gently downward and slightly backward, when little difficulty will be experienced. The cotton tampon is usually employed for the application of glycerin, ichthyol, or some other medicine.

Carded Wool Tampons.—In cases in which it is desired to make gentle pressure for some time to correct a faulty position of the womb, carded wool is made into various shapes, sterilized, anointed with an antiseptic ointment, inserted into the birth-canal, and allowed to remain for several days. Special care must be taken in the making and sterilization of such tampons that they be absolutely clean. Ointments of boric acid, ichthyol, lanolin, or other medicines are usually employed with such tampons.

Vaginal Capsules.—In some cases gelatin capsules containing carded wool are medicated with a desired drug, inserted within the vagina, and allowed to remain. The heat of the body melts the gelatin, and the medicated wool is left in contact with the parts. It is sometimes convenient to dip these capsules in warm water just before inserting. They are removed by pulling upon a string which is attached to the wool within the capsule. If a nurse is asked to medicate such a capsule, she will find it composed of two parts, one sliding over the other. By slipping these parts asunder she can put upon the wool glycerin or any other medicine desired.

PESSARIES.

Pessaries are supports for the womb, made of rubber, and usually of hard rubber. They serve the place of a crutch or of a truss, and are employed until the patient can grow strong enough to maintain the womb in proper position without their aid. If this does not happen, the condition for which the pessary was introduced is usually treated by some form of operation. To prepare a pessary for introduction by the physician, the nurse must remember not to boil a rubber pessary. Hard-rubber pessaries are so softened by boiling that they lose their shape. If the physician desires to bend a hard-rubber pessary, he may soften it in boiling water or over an alcohol lamp. Pessaries should be washed thoroughly with soap and warm water, rinsed, and put into an antiseptic solution until

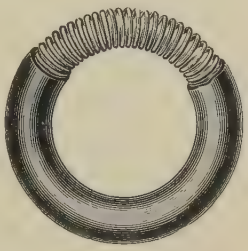
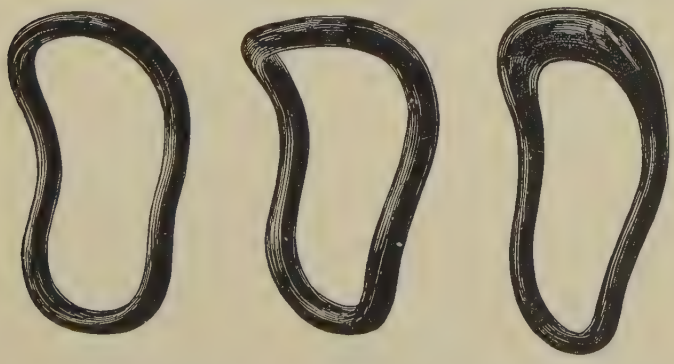


FIG. 78.—Spiral pessary.



a *b* *c*

FIG. 79.—Pessaries for retroversion: *a*, Hodge pessary; *b*, Smith pessary; *c*, Thomas pessary (Penrose).

used. They are of various shapes and kinds according to the condition for which they are used in treatment.

Introduction of the Pessary.—To prepare a patient for the introduction of a pessary, the nurse should make the patient's clothing perfectly loose about the waist. The bladder should be emptied, and the bowel if convenient. The patient will be placed in such a position as the physician desires, usually the dorsal or the Sims'. There may be needed a Sims' speculum and tenaculum-forceps. Occasionally other instruments are used. A lubricant is necessary, and the pessary and instruments should be made thoroughly clean. The patient's limbs should be suitably wrapped and protected during the introduction of the pessary. During this the nurse may sometimes assist the physician by holding his instruments or by some other slight manipulation. When the pessary has been inserted the physician may change the patient's posture, often putting her in the knee-chest posture for a few moments. The nurse should have this in mind, and should have arranged the patient's clothing so that she can be readily shifted, and have the table or bed suitably prepared.

Caution to Patients.—The nurse as well as the physician should caution patients that a pessary may do harm as well as good. If the patient feels better after the introduction of the pessary, it is doing good. If, however, she has pain, with a considerable discharge of mucus and interference with the bladder and rectum, the pessary is doing harm. She must then go to the doctor at once. The patient must not be frightened if the pessary comes out. Cases are sometimes seen in which it is very difficult to fit a pessary so that it will be retained. The patient may find the end of the pessary protruding from the vagina after she has emptied the

bowel or bladder. While this is annoying and possibly terrifying, there is no danger connected with the spontaneous expulsion of the pessary.

Removal and Readjustment of the Pessary.— When the pessary has ceased to be needed it is removed, and the patient allowed to go without, or another better suited to her condition is inserted. The duties of the nurse are the same as those already described. The old pessary should be wrapped in paper so soon as removed and burned. Nurses must be careful to warn patients that while wearing a pessary they require at least one vaginal douche daily. The physician will prescribe what medicine, if any, should be employed in the douche. Borax or boric acid is most frequently ordered. If required, the nurse may teach the patient how to take the douche, remembering that in the introduction of the douche-tube the tube should be pressed backward toward the rectum, to avoid interfering with the pessary. The nurse is sometimes asked by the patient to remove the pessary. She should not do this without the physician's consent and request. To accomplish this manipulation, the patient should be placed upon her back at the edge of the bed or table, her feet supported on chairs. The nurse, having thoroughly washed her hands and lubricated the index finger of one hand with soap, should insert it within the vagina, passing it upward behind the pubic bone. She will then feel the anterior bar of the pessary; she should hook her finger over this bar and then pull gently downward and backward, turning the pessary slightly sidewise upon its edge, when it will usually come out without difficulty. If the effort gives the patient considerable pain, and if the nurse cannot readily accomplish the removal of the pessary, she should cease her efforts and report to the physician in charge.

CHAPTER IV.

DOUCHES.

A VERY important part of the nurse's duties in the care of gynecologic cases consist in the giving of douches. These may be vaginal, intestinal, or vesical. In the first, fluid is injected into the vagina affecting the neck of the womb and vaginal tissues; in the second, the mucous membrane of the bowel is treated by injections; while in the third, the mucous membrane of the bladder is douched.

VAGINAL DOUCHES.

Fluids used for this purpose are water only, astringent solutions, and antiseptic solutions. Water is employed for cleanliness or to convey heat.

The Hot Vaginal Douche.—This is a most valuable method of treatment, but must be given in the correct manner to have a good effect. The temperature of the water must be ascertained by a thermometer. It should be from 110° to 120° F. At least a gallon is needed for each douche. The water must be applied continously to the parts treated. The patient should lie recumbent in the dorsal position. If she assumes a crouching or sitting posture, the water runs away as quickly as it is injected, doing little good. From fifteen to twenty minutes are needed for the giving of a hot douche. The nozzle must not be of metal, as such may become so heated as to burn the patient. The nozzle or tube must

be of hard rubber or of glass (Fig. 80). It is best for the patient to remain recumbent for some time after the douche, to secure its best effects. If the patient has no

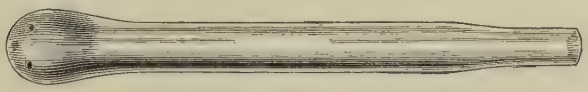


FIG. 80.—Vaginal irrigating nozzle.

nurse and is obliged to take the douche alone, she may do so in an ordinary large bath-tub, in which she can recline while taking the douche.

Astringent Vaginal Douches.—Astringent vaginal douches are those of solutions of alum or combinations of gallic and tannic acids. The exact strength of these will be prescribed by the physician in charge. Zinc sulphate is also used in solution for astringent douches. The temperature of these douches is usually from 85° to 90° F., and the quantity from two quarts to one gallon.

Antiseptic Vaginal Douches.—These are given for the purpose of destroying bacteria in the mucous membrane of the vagina. Solutions of *mercuric chlorid* are very commonly used for this purpose. If there is much mucous secretion, the nurse must remember that bichlorid cannot destroy germs contained in mucus, as the bichlorid combines with the mucus to form an insoluble compound. The mucous membrane must be cleansed in these cases by a douche of soapsuds followed by warm water. If the mercurial douche be then administered, it will have its antiseptic effect. The strength of bichlorid douches must be carefully regulated by the physician in charge. 1 : 4000 is a strength often employed. As mercuric chlorid is a powerful poison, vaginal douches may poison the patient. Symptoms of this condition would

be a bloody and mucous diarrhea, salivation, variation in temperature and pulse, and should the case become severe, finally prostration and death. Mercuric chlorid combines with mucus to cloud or coat douche-tubes. This must be removed by boiling the tubes in a solution of soda. Mercuric chlorid is usually sold in tablets readily soluble. If furnished to the nurse in solution, she must be careful to observe that there is no precipitate at the bottom of the bottle. This would be undissolved bichlorid, and might be a source of danger. The addition of common salt and the shaking of the bottle vigorously will usually dissolve any precipitate.

Carbolic-acid douches are not used as frequently as formerly, because creolin and lysol have taken their place. Solutions of carbolic acid are very dangerous if the acid is not perfectly dissolved. If the nurse sees at the bottom of the bottle globules or drops of a brownish oily substance, the carbolic acid is undissolved and may fatally burn the patient. To such a solution must be added sufficient glycerin or alcohol to make the solution thoroughly clear after the bottle has been shaken. Carbolic acid is usually employed for douches in strength of 1 per cent. Symptoms of poisoning by this drug are scanty, smoky urine, burning sensation in the vagina, and the gradual development of coma and death.

Creolin is a carbolic preparation making with water a mixture resembling chocolate and milk in color. It is slightly oily, has a strong and not unpleasant odor, is less poisonous than carbolic acid, but in 2 per cent. solutions is sometimes very irritating. It stains linen and rubber sheeting badly. Creolin is a very useful antiseptic in many sorts of gynecologic treatment, as it is antiseptic and lubricant as well.

Lysol is a refined preparation of creolin, which has all of its advantages without some of its unpleasant features. Lysol is much the color of brandy, is slightly oily, and has a clean and pleasant odor. It is employed in 1 per cent. solutions for douching, and is often used for washing out the uterus after curetting. Like creolin, it usually mixes well with water, and accidents seldom occur in its use. It is more expensive than creolin or carbolic acid. Cresol much resembles lysol and is preferred by some.

Boric-acid douches are unirritating as a rule, and may safely be entrusted to a patient. A tablespoonful of borax to a quart of water is not too strong, and a tablespoonful of boric acid to two quarts is frequently used. If it does not readily dissolve, the addition of a teaspoonful of glycerin to the quart will assist in its solution. *Boroglycerid* is a combination of boric acid and glycerin frequently used in gynecologic practice. It is employed upon tampons and in douches. It may be used as boric acid would be.

Thymol is an oily substance derived from thyme, and has been used in 1 per cent. solution as a mild antiseptic.

Potassium Permanganate.—In cases of cancer potassium permanganate is often used in vaginal douches. The strength must be prescribed by the physician. The color of the solution is usually that of port wine. It is unirritating, and very useful in destroying the foul odor which arises from cancer.

Salt Solution.—This solution is often employed in washing out the uterus after curetting, or in douching the vagina after some of the major operations. It may be prepared by adding one and a half drams of table-salt to two pints of water. This solution must then be sterilized

by boiling for thirty minutes. It is usually given at a temperature of from 85° to 95° F.

The Temperature and Quantity of Douches.—Hot douches are given at a temperature of from 110° to 120° F. Warm douches are from 100 to 110° F. Douches for cleansing or antisepsis are from 85° to 90° F. To accomplish much, at least two quarts of fluid are required for a douche, and one gallon should be employed whenever possible.

Syringes and Douche-tubes.—The fountain-syringe is the only one to be chosen for this purpose. The Davidson syringe is liable not to work properly by reason of its valves, and may become so soiled that it cannot be cleaned. Piston-syringes are not always easy to manipulate, and may force the fluid with too great violence. A fountain-syringe should be of good quality, containing two quarts, and have a large and good rubber tubing connected with it. The catch upon the tubing should be one which can be completely opened or closed, and not one which exercises considerable pressure upon the tube constantly.

The best douche-tubes are of glass, and should be made of especially chosen glass that the danger of breaking may be reduced to a minimum. The writer employs a douche-tube made for him, which can be used in obstetric practice to wash out the uterus should hemorrhage occur after labor. It is made of especially selected glass, and has along the under surface a groove which provides a return flow for the fluid used. Such a tube can be boiled with other instruments and thus made thoroughly sterile. When not in use it should be kept in a solution of soda or in a solution of carbolic acid or lysol. Hard-rubber tubes are next to glass in value, but

cannot be thoroughly boiled without softening. Complicated metal tubes for douching the uterus or vagina are exceedingly hard to clean and sterilize, and are seldom used. They must be taken apart to be cleaned, and the joints and thread are especially likely to retain mucus, blood, or pus. In hospital practice a douche-tube used for one patient should not be employed for another while the first patient is under treatment. The tubes should be placed in jars, filled with antiseptic fluid, when not in use, and the jar labelled with the name of the patient. In this manner the danger of contagion is reduced as much as possible.

Posture of Patient.—Patients are usually placed in the dorsal position to receive douches. The physician may order the pelvis raised, and occasionally the patient is turned upon the side or placed in the knee-chest posture.

Douche-pans.—In lack of other appliances a douche may be given with a tin basin to receive the return fluid. If the patient be placed upon a folded quilt, the edge of the basin may be passed beneath the buttocks, and thus a considerable quantity of fluid may be used in the douche without soiling the bed. If the patient be turned across the bed and brought to the edge, a piece of rubber sheeting or oil-cloth may be placed beneath her, brought into a bucket under the bed, and the douche given with this precaution. A firmly rolled sheet or large towel should be placed beneath the rubber sheet under the patient's back, to prevent the fluid from getting into the bed. It is best, however, in giving douches to use a douche-pan, bed-pan, or some other appropriate contrivance (Fig. 81). Douche-pans are of various kinds. Some are made of tin, having an exhaust-tube at the side which

allows the water to run out as fast as the douche is used. Others are of agateware and still others of rubber or of earthenware. It is usually a comfort to the patient if that portion of the douche-pan upon which the body rests be covered by a towel. If a bed-pan is employed, a folded towel should be placed beneath the patient's

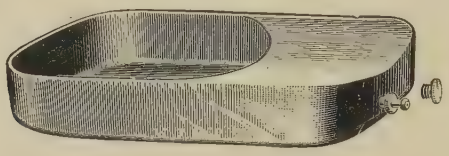


FIG. 81.—Zinc douche-pan.

back where it rests upon the pan. In some cases covers are made for a bed-pan which can be slipped on and removed and washed after use. The Kelly pad is especially useful in the giving of douches. This should be well inflated, and care taken that the pad is placed upon some firm substance in the bed. If the bed is soft and sinks under the patient, no douche-pan will prevent the spilling of fluid. If the bed be firm, or if the pad or douche-pan be placed upon a firmly folded sheet or other material, the douche can be neatly given. Douche-pans must be kept absolutely clean, being washed with soap and hot water or hot soda solution after each using and carefully dried. They should not be kept in the patient's room under any circumstances, and should not be placed in a closed cupboard or closet. They should be allowed to dry thoroughly in the air. The Kelly pad should be allowed to collapse after it is used, and should be thoroughly washed and dried. It may then be hung up to become perfectly dry.

Method of Giving Douches.—Probably no treatment can be so successfully carried out and with such

little discomfort if the nurse has tact and skill, or may become a source of annoyance and in some cases of positive injury. The necessity for absolute cleanliness with everything connected with the patient and the appliances used cannot be too strongly emphasized. The nurse should receive from the physician definite instructions as to the number of douches, the composition and quantity of each, and the time for administration. The posture of the patient must also be described. The bladder should be emptied before the administration of the douche, and the fluid should be prepared in accordance with the doctor's orders. If the weather be cold, the nurse must see that the douche-pan or apparatus is warmed. The nurse should prepare the fluid, testing its temperature with a thermometer. There should be in a sterile pitcher an additional supply of fluid. Having placed the patient comfortably upon the douche-pan, her limbs protected by sheets or folded blankets, the nurse should scrub her hands with soap and water, then rinse them thoroughly in hot water, and then scrub them in mercuric chlorid solution (1 : 2000). She should then cleanse the external parts of the patient with sterile cotton and an antiseptic solution. Usually mercuric chlorid (1 : 2000) is employed. The douche-tube should have been boiled, and brought to the bedside in a basin or sterilizer with sterile water. Taking two bits of antiseptic cotton or gauze and handling the douche-tube and the rubber tube with them, the nurse may connect the two, the douche-bag having been hung not higher than four feet above the patient at a convenient distance. The nurse should be careful not to touch that portion of the douche-tube which is inserted within the body. With the thumb and fingers of the left hand she should then

separate the labia, introducing the tube gently with the right hand. Just before the introduction of the tube the fluid should be allowed to run through the rubber tubing. The douche-tube should then be passed gently downward and backward until three or four inches of it are within the patient's body. The nurse must see that the fluid in the bag does not become entirely exhausted, as air would be injected and injury might result. Just before the whole amount of fluid has been exhausted the nurse should carefully withdraw the tube, placing it in a basin of bichlorid solution and cotton. She should then dry the external parts with sterile cotton, and dry the back or any other portion of the body which may have become wet. If douches are carefully given, they are a source of benefit and comfort in properly selected cases.

Cautions and Dangers in the Use of Douches.—A nurse should not accept the responsibility of giving intra-uterine douches. Such should be administered by the physician himself. During the giving of the vaginal douche the patient may complain of severe pain in the lower part of the abdomen, with a sensation of faintness and nausea. This usually arises from the entrance of some of the fluid into the uterus, producing irritation and setting up sudden and painful uterine contractions. Such uterine colic, as it is termed, while not dangerous, is excessively distressing to the patient and even alarming. This accident is best avoided by not introducing the douche-tube too far, by not hanging the douche-bag too high above the patient's head, and by gentleness in the administration of the douche. Sometimes air and not fluid is injected into the uterus in the giving of douches. If considerable violence be employed, air may enter the veins and sudden death may result. This has

been observed in cases in which fluid was injected very forcibly into the womb, usually for criminal purposes. A nurse may infect a patient, especially after labor or an operation, by unclean douche-tubes, by fluid not properly sterilized, and by dirty hands and appliances. She may also do damage if she introduces a douche-tube forcibly and thrusts it too far into the body of the patient. If the solution be too strong or if the medicine employed be not properly dissolved, fatal poisoning and burning may result. A case came under the writer's observation during the time when carbolic-acid douches were extensively employed, in which a night-nurse was given a solution of carbolic acid not perfectly dissolved. From this solution, five patients received douches at various stages of the lying-in period. Of these, three died as the result of burns received from the douche fluid.

Douches after Plastic Operations.—After operations upon the cervix, vagina, pelvic floor, and perineum douches are often employed to cleanse the stitches and promote healing. The composition of the douche will be ordered by the physician. They are usually dilute antiseptic solutions. In inserting the douche-tube in such a case the nurse should know in what part of the vagina the stitches have been placed. If upon the posterior wall, she may carry the tube gently but firmly along the anterior wall. If, on the contrary, the stitches have been placed in the anterior vaginal wall, the tube should be pushed gently backward, thus avoiding the stitches. The douche-tube is one of the best means for cleansing stitches, and may be inserted but a part of the way, just sufficiently to carry the fluid to the stitches. Better than the use of the tube in skilful hands is the method of cleansing stitches by pouring antiseptic fluid from a small

pitcher. If the labia be separated by the thumb and fingers of the left hand, fluid may be so poured upon the parts as to cleanse them very efficiently.

INTESTINAL DOUCHES.

In many invalid women chronic disease of the intestines is one of the chief complications of the case. Such require especial treatment, and intestinal douching may be employed.

Solutions.—Normal salt solution and solutions of sodium bicarbonate or sodium salicylate are most frequently used. The quantity employed is usually from one to two gallons. The temperature varies from 90° to 70° F.

Tubes for Intestinal Douching.—The best tubes for this purpose are of the best quality of rubber, usually red in color and of medium size. The nurse will find that the medium-sized tubing is better than the small. It is a waste of money and effort to procure any but the best tubing, as the cheaper soon loses its elasticity and is very unsatisfactory. A fountain-syringe is employed to hold the fluid, and as the quantity used is considerably larger than in vaginal douching several pitchers are employed for this purpose.

Posture of the Patient.—In most cases the patient is turned upon the left side and the pelvis slightly raised. Occasionally the knee-chest posture is employed during a part of the douching.

Method of Giving.—If a large intestine is to be douched, the rectum must be first emptied. Accordingly the bowels must have been moved by medicine or by an enema before the douche is given. Having prepared the fluid, and having sterilized the tube in an antiseptic solution and the patient being in position, the tube

is attached to the fountain-syringe and is lubricated with sterile olive oil, glycerin, or an ointment prescribed by the physician. Allowing the fluid to run, the nurse introduces the tube, gently giving it a slightly spiral motion. If the tube meets much resistance, the nurse should stop and hold it at the point already inserted. With patience and gentleness she can usually succeed in introducing the tube a very considerable distance. It may be inserted as far as it will go without injury if gentleness be used. The fluid should be allowed to run freely, and the patient urged not to strain or bear down. As the intestine becomes distended the patient will have a desire to empty the bowel, but this should be resisted until the bowel is as full as possible. The patient may then allow the fluid to escape, or, if the physician advises, she may rise and use a commode. If it is desired to have the fluid return promptly, a large-sized soft catheter may be inserted along with the douche-tube, providing for a return flow of the fluid. In some cases the nurse practises gentle massage of the abdomen with the left hand while inserting the tube with the right. The patient may be placed in the knee-chest posture in some cases, as the fluid will then gravitate into the transverse colon, completely distending the bowel.

VESICAL DOUCHES.

In cases of inflammation and catarrh of the bladder vesical douches are a very efficient means of treatment. In many cases their administration is carried out by the physician, as he may desire especially to judge of the results of the treatment. In other cases this method is entrusted to a nurse.

Fluid Employed.—A saturated solution of boric acid, sterile water, normal salt solution, lysol or creolin

(1 per cent.) are the fluids most often used. At first a small quantity only is introduced within the bladder, but as the patient grows accustomed to the treatment from a pint to a quart may be used. In some cases several quarts are employed. The temperature of the solution should be from 85° to 90° F. In some cases it may be from 90° to 100° F.

In some cases preparations of silver are ordered for injection into the bladder. If the nurse is entrusted with this treatment, she must be very careful to carry out orders exactly. The bladder is usually irrigated first with sterile water, and the urine and water thoroughly emptied through the tube. The quantity of silver solution prescribed is then injected, and after a few moments allowed to escape, and this is often followed by irrigation with salt solution. The nurse must be careful to carry out the treatment exactly as indicated, as carelessness may result in harm to the patient. Caution must also be exercised that the patient's linen is not stained by the silver preparation.

Posture and Preparation of the Patient.—The patient lies in the dorsal position, and need not be brought to the edge of the bed or table. The douche can usually be given while the patient lies in bed in the ordinary posture. In some cases the pelvis may be raised. The patient should be prepared by having the external parts thoroughly cleansed with soap and water and rinsed with water, and then with mercuric chlorid (1 : 2000). The apparatus required should be thoroughly cleansed and the catheter sterilized by boiling. The solution must be prepared and readily available, and a basin should be placed between the patient's thighs. If she be put across the bed, a Kelly pad may be used and

a slop-jar as for a vaginal douche. As it is often desirable to save a specimen of urine for examination, a clean six-ounce bottle and cork should be in readiness.

The apparatus required consists of a medium-sized soft-rubber catheter, a piece of glass tubing several inches long, a piece of good quality rubber tubing two feet long, and a medium-sized glass funnel (Fig. 82). The funnel and rubber tubing and glass tubing should be connected first.

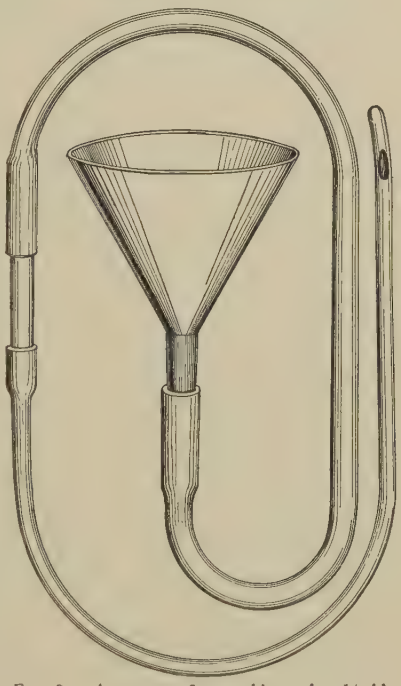


Fig. 82.—Apparatus for washing the bladder (Penrose).

Method of Giving the Douche.—After the nurse has cleansed her hands and made them antiseptic, the catheter, having been previously boiled, should be lubricated with sterile olive oil or sterile glycerin. It should then be introduced and the urine allowed to escape. If desired, it should be reserved for examination. The catheter should then be withdrawn and connected with the glass tubing. The funnel should be held about three feet above the patient and be filled with the solution desired, which is allowed to begin to run through the catheter. The catheter should then be introduced

again, and the fluid should continue to run until the bladder begins to be distended. The patient will usually complain of slight pain or sense of distention in the bladder. When the fluid has ceased to run easily from the funnel the funnel should be filled and quickly depressed below the level of the patient. The fluid in the bladder will then escape by siphon action. This must be done as gently as possible, the character of the fluid returning being closely watched. The washing must be repeated until the fluid returns perfectly clear. To remove the catheter, it should be disconnected from the glass tubing and the finger be placed over the end of the catheter. It may thus be withdrawn without soiling the parts with discharges from the bladder. After the douching the parts about the meatus should be thoroughly cleansed with sterile water and sterile cotton. As many cases of disease of the bladder suffer great pain and the bladder becomes exquisitely sensitive, the nurse must be very gentle in her manipulation. In severe cases the bladder will not retain more than an ounce or two of fluid, and yet the washing of the bladder with this small quantity of warm, sterile fluid often gives considerable relief.

Care of the Apparatus Employed.—It is of the greatest importance that catheters be kept absolutely clean. They should be boiled for from twenty to thirty minutes in soda solution and kept in a solution of lysol or carbolic acid. Before using the catheter must be thoroughly flushed out with hot or sterile water. Unless the greatest caution be observed in the care of catheters, it is possible that the treatment may indefinitely prolong and even aggravate the disease.

CHAPTER V.

GENERAL CARE OF GYNECOLOGIC PATIENTS.

REST.

In many cases the patient's suffering has been greatly aggravated by her efforts to perform duties for which she is physically incapable. In her weakened condition each pain has been aggravated, and it is impossible to estimate accurately her symptoms or give her prompt relief without putting her at rest. In some cases rest in bed during the entire day is impossible and even undesirable, but in these cases a number of hours of rest in bed will be definitely prescribed. Rest also implies not only the recumbent posture, but also freedom from annoyance and interruption. It is very hard for the mother of a family to obtain this or for those who have others dependent upon them. In aggravated cases the patient is far better in a hospital, where a rest-cure may be added to other methods of treatment. In the matter of rest, it is the nurse's duty to obtain from the physician definite orders as to the number of hours of rest desired, and whether that be absolute or partial. These orders the nurse must carry out accurately but kindly. When complete isolation is required no one should see the patient but the nurse and the physician. The patient must abandon for the time communication with the external world, not receiving mail or communications of any sort. While the first few days of such a procedure

may be irksome and trying for the patient, the good effect is very soon manifest.

FOOD.

These patients are almost invariably badly nourished, and require persistent and very careful feeding. Many of them positively assert that they cannot take milk, and others have appetites so degenerated that they prefer only indigestible and poorly nourishing food. Food must be prescribed for these patients as definitely as medicine would be. The nurse must keep a faithful record of the amount and sort taken, with the intervals of feeding. Food must be administered regularly, and usually without questioning the appetite of the patient. As her strength increases and she becomes rested a healthful appetite will return. Much can be done if the nurse will make the food as palatable as possible, and will serve it in an agreeable and absolutely neat manner.

Forced Feeding in the Insane.—With insane patients who will not take food, artificial feeding must be practised, sometimes for months or even years. The best method consists in feeding by the nose through a tube passed through the nostrils into the esophagus. As the patient can take liquids only by this method, she must be fed every three or four hours. If milk is employed, it must often be predigested. Some of these patients will drink water, while others refuse both food and drink. In caring for these cases a nurse must have precise written directions as to what sort of food shall be given ; the quantity, temperature of the food, and intervals of feeding. Tubes used for this purpose must be repeatedly sterilized by boiling, and when not in use kept in a saturated solution of boracic acid. Maniacal patients

may require restraint, either constantly or during feeding. Even in these cases it is sometimes difficult to use the tube. With patience and tact, however, the result can usually be obtained. Medicines are often added to food, which disguises them for patients who will not swallow.

Rectal Feeding.—In some cases forced feeding through the nose may be supplemented, or substituted by rectal feeding. For this purpose solutions and mixtures already prescribed in treating the pernicious nausea of pregnancy may be employed. The rectum should be thoroughly irrigated once in twenty-four hours with warm salt solution. Rectal tubes should be repeatedly sterilized by boiling, and when not in use kept in boracic solution, creolin, or lysol. In giving these injections the patient should be turned upon the left side with the pelvis raised, and a pad should be placed over the bowel so soon as the injection is given. Medicines are frequently added to rectal injections.

WATER.

In such patients the excretory organs perform their duties imperfectly, and it is desirable that the patient take a large quantity of water. This must be given at regular intervals, and its importance must not be overlooked. The physician should prescribe what sort of water the patient is to have. Saline waters abound, and are very useful in the treatment of these cases. So simple a thing as water may be given in a very desirable manner. If the water is not cool and refreshing, if the glass in which it is given is not clean, if empty water-bottles are allowed to accumulate in the room, the patient may be so disgusted that she will fail to take the required amount. Very few persons take sufficient water, and so

the formation of this new habit may be a novelty to the patient and one resulting in great good.

THE EYES.

Many of these patients have poor sight, and the eyes require the aid of glasses. Others have catarrhal inflammation of the eyes of a chronic nature. Some cannot read while lying in bed, and hence the nurse must read to them. The nurse should take care that they do not fatigue the eyes by improper and prolonged use.

THE CARE OF THE SKIN.

Such patients excrete badly through the skin and require constant attention. A soap-and-water sponge-bath in the morning, and an alcohol sponge with light massage at night, form a useful treatment in most cases. The physician may prescribe medicated baths, to be given by sponging, packing, or in the tub. Such are effervescing saline baths, bran baths, salt baths, or sitz-baths. In tub-bathing the nurse must be careful that the bath is of the proper temperature, and that the patient does not remain in the bath too long. For neurasthenic patients a spray-and-needle bath is sometimes employed with good results. The wet pack to relieve insomnia or the pack to reduce fever may also be employed. The administration of baths is a good test, for the nurse's skill and tact are no more manifest than in this treatment. The avoidance of scented soaps and absolute cleanliness in sponges or wash-cloths are demanded. Many prefer not to use sea-sponges, as it is practically impossible to clean them, but use knitted wash-cloths, which can be repeatedly boiled.

Manicuring and Pedicuring.—The hands and feet of patients should receive daily attention. The arts of

the manicure are required, and will be greatly appreciated by these cases. Many patients do not feel clean and comfortable unless this matter receives attention.

CARE OF THE MOUTH AND TEETH.

Nurses should see to it that these patients receive constant care of the mouth and teeth. Very frequently, disordered secretions in the mouth give a constant bad taste and annoy the patient greatly. The mouth should be rinsed frequently with a mild antiseptic, such as boracic-acid solution, or some solution containing thymol. The teeth should be brushed frequently, and if the gums are soft and spongy, applications of myrrh and other astringents should be made.

Massage is a most useful adjunct in the treatment of these cases. Such may be general massage, intestinal massage, or pelvic massage.

General Massage.—In general massage the available muscles of the entire body are picked out by the masseuse and subjected to kneading, rubbing, or tapping. As most women with pelvic disease are malformed through improper clothing, the muscles of the back will be found very deficient in development. Massage is especially useful with these patients in bringing them into proper development. Other women are abnormally fat, and the waist must be reduced by vigorous rubbing and kneading. In connection with general massage, oil inunctions are sometimes practised in cases of profound anemia.

Intestinal Massage.—When constipation is obstinate intestinal massage may be given daily, and is sometimes combined with douching of the intestine. The rubbing should follow the course of the large intestine, beginning upon the right side near the groin, passing up along the

right, across the center, and down the left side. The rubbing should be gentle but thorough.

Intestinal Massage with Salines.—In cases where the patient is greatly annoyed by gas and other forms of indigestion, she will be greatly benefited by drinking hot water, and then receiving massage beginning over the stomach and extending along the intestine. In many cases Carlsbad salt, sulphate of magnesia, or Rochelle salt may be added to the water which is taken, greatly to the patient's advantage.

Pelvic Massage.—This special branch of massage is designed for the treatment of some obstinate cases of pelvic inflammation. A nurse should not attempt it without personal instruction from a physician or one skilled in its use. To perform this treatment, a vaginal douche of an antiseptic solution is first given. The patient is in the dorsal position, with her limbs flexed and her feet resting on chairs. The head and shoulders are raised. Having made her hands aseptic, the nurse anoints the fingers of one hand with an antiseptic ointment and inserts them within the vagina. The other hand is placed upon the abdomen of the patient behind the pubes. When the position of the womb has been outlined by the internal hand gentle rubbing and pressure are made upon the tissues which are felt to be in a resisting and unelastic condition. As the fingers are passed deeply downward and backward the effort is made very gently to raise the womb upward and forward. Should the patient complain of severe pain the effort should stop at once. It is evident that this form of massage if improperly done might result in very serious injury. Those nurses who desire to make obstetric and gynecologic work a specialty may take the opportunity to

receive instruction in this branch of massage, as they will sometimes find occasion to practise it.

Postural Gymnastics.—In connection with pelvic massage, patients may be taught to assume postures and to make voluntary movements which will strengthen the muscles of the pelvic floor and thus strengthen the supports of the womb. In some cases the patient is placed upon the back, and the nurse, taking the thigh and flexing it, causes the patient to resist or to push downward with the thigh and leg. This resistance puts into action certain muscles of the pelvis which are weak. In other cases exercises of a similar nature are employed. In connection with such gymnastics Swedish movements may be given to the patient, with or without machines adapted to the purpose. Pelvic massage and postural gymnastics are a special branch of massage and physical training which must be learned from those especially fitted to teach and practise it.

ELECTRICAL TREATMENT.

Electricity is often employed to strengthen the nervous systems of invalid women. The administration of the current may be assigned to the nurse. Both the faradic and the galvanic current are used as directed by the physician. In some cases the faradic current is employed to contract the muscles; in other cases the faradic current is employed as a general stimulant; while in still others the galvanic current is used in the treatment of pelvic neuralgia. The nurse must receive from the physician definite instructions regarding the use of electricity, the length of time that each current is to be employed, and the method of its administration. She must be careful in the care of the battery that the carbons are

removed from the fluid when not in use, and that battery fluid is not spilled upon the metal portions of the battery. She must also take pains that the electrodes are kept clean, that clean cotton is employed to cover them, and that the water with which they are moistened is of a comfortable temperature. Care must be taken that the patient does not become chilled during the use of electricity, and that the administration is not too prolonged. A record should be kept of this treatment, as of all other treatment adopted in any case.

Electric Cabinet.—Mention has already been made of treatment by the electric cabinet to promote sweating. This has been found very useful in treating the toxemia of pregnancy. In many gynecologic cases the action of the skin is very deficient, and treatment by the electric cabinet is exceedingly useful. Precautions must be taken that the room in which the cabinet is placed is thoroughly aired, so that the patient may not feel oppressed during the sweat by a foul atmosphere. The physician should indicate as precisely as possible the length of time the patient must remain in the cabinet and the degree of temperature desired. In these cases the action of the skin is greatly stimulated by causing the patient to drink very hot water while in the cabinet. Some patients who cannot take hot water prefer to drink moderately cold water. A cold cloth or dry ice-bag should be placed upon the head while the patient is in the cabinet. After the sweat the patient should be placed between blankets and the skin thoroughly but quickly washed with soap and warm water, and a light massage with alcohol then given.

Electric Baths, Mud Baths, Carbonic Acid Baths.—Electricity is sometimes applied to patients

while in a warm bath, and in this way the effect of the bath is greatly increased. In other cases of chronic pelvic congestion or inflammation the patient sits and has warm mud packed about the lower portion of the body. Soil is selected which contains iron or which contains some of the sorts of clay which act as a mild counter-irritant. The duration of the mud bath should be definitely prescribed by the physician, and also the temperature at which the mud is applied.

In some of the baths of Germany and Austria this method is extensively used.

Carbonic acid baths are prepared by placing in warm water two substances which unite, setting free carbonic acid gas. The effect is to stimulate actively the peripheral nerves, increasing the action of the skin, and producing a tonic effect upon the patient. The use of sea salt in bathing has long been familiar, and salt-water baths, followed by thorough massage with oil, often prove exceedingly beneficial.

It is difficult to carry out complicated baths in private houses without the necessary apparatus. Although the best medicinal baths are in Europe, there are in America a number of establishments where such treatment is thoroughly done. Nurses who make a specialty of massage and bath treatment are found at these places who usually give baths; but any well-trained nurse should be able to use them under precise written directions by the attending physician.

INTRAVENOUS MEDICATION AND VACCINES.

Salvarsan, the modern remedy for parasitic diseases of the blood, is given by direct injection into a vein. This treatment is best carried out in a hospital where aseptic

technic is at hand, and where the patient can be carefully watched after the injection. The nurse in charge should ascertain in what region of the body the injection is to be made, and should prepare the part antiseptically. She should sterilize the needles employed and receptacles used, and the injection should be made under antiseptic precautions. In some cases partial anesthesia is employed. She should note changes in the pulse and temperature and the presence or absence of pain after the injection.

Vaccines are used extensively in disease produced by bacteria where the patient's natural power does not seem sufficient to overcome the germs. These injections are usually made into the muscles, and the nurse should take the usual precautions to cleanse the skin and to sterilize thoroughly the needles aud instruments employed. If vaccines do good, the temperature becomes lower and the suppurative process gradually ceases. Antitoxic, anticoccic serum, and serum employed in meningitis and other sera are given usually by hypodermic injection. The usual antiseptic precautions must be taken in these cases.

THE CARE OF THE INTESTINES.

It is of paramount importance that all patients have proper evacuation of the intestines. To bring this about the nurse may employ under the doctor's orders suppositories, enemas, or lavage. The diet may be so regulated as to favor the avoidance of constipation, and the precise method of relieving the difficulty will be decided by the physician. It is the nurse's duty, however, to note any tendency to constipation, and to report it at once to the physician for his treatment.

CHAPTER VI.

GYNECOLOGIC OPERATIONS.

These may be conducted in hospitals or in private houses. No two operators perform the same operations in precisely the same way, and in no two operators' operating-rooms are precisely the same regulations enforced. It is the duty of the nurse to learn thoroughly the methods of the operator with whom she is working. If she assists him for the first time, she should if possible obtain from him definite directions regarding the arrangement of the details of the operation and make written notes of his wishes in this matter. It is unsafe to trust to a verbal understanding of such important things. In hospital operating-rooms the great advantage of suitable appliances is very evident, while in private houses the ingenuity of the nurse and operator is often severely taxed to supply the deficiency.

Gynecologic operations from the standpoint of gravity may be divided into those in which the peritoneal cavity is not opened and those in which the peritoneal cavity is opened. Infection of the peritoneum is so dangerous that the division may be based upon the presence or absence of an opening into this important portion of the body.

OPERATIONS IN WHICH THE PERITONEAL CAVITY IS NOT OPENED.

Such are dilatation and curetting of the womb, the removal of small tumors from the womb, operations upon

the womb to straighten or enlarge its cavity, operations to remedy deformities in the vagina, operations for tumors of the vagina and labia, and operations upon the urethra or the neck of the bladder, and those performed upon the rectum. The removal of cancer from the neck of the womb is also included in this division. Plastic operations performed to remedy lacerations occurring at labor come under the head of obstetric surgery.

Preparation of Patient.—For all these operations the bowels must be thoroughly emptied. A specimen of urine must be sent to the physician for examination, the action of the skin must be stimulated by baths, and the patient should be prepared by several days' rest in bed and by very nutritious but easily absorbed and digested diet.

Disinfection of the Field of Operation.—The field of operation must be disinfected by the repeated application of cleansing and antiseptic substances. Scrubbing the mucous membrane of the vagina with tincture of green soap or green soapsuds, by cotton pledgets and dressing-forceps, followed by copious douching with sterile water and bichlorid solution, is the method usually employed for preparing this portion of the body. The physician may trust to vaginal disinfection to prepare the cervix for operation, or he may cleanse it himself by suitable applications. If the neck of the bladder or urethra is to be operated upon, it may be necessary to douche the bladder for several days after the manner described in the chapter on Douches. The physician may make applications to the urethra for several days before operating, to bring about a healthy condition of the mucous membrane. Disinfection of the bowel is accomplished by douching and by very copious irrigation with warm salt solution.

As many of these patients suffer from hemorrhoids, care must be taken not to wound these structures. Lysol is preferred by many in the disinfection of the rectum and adjacent tissues. The hair should be carefully trimmed from the parts, or the parts may be shaved if the operator so desires.

Dress of the Patient.—For such operations, unless the weather be excessively hot, the patient should wear a light woollen undershirt and a short night-dress or bed-gown. The lower limbs should be covered with canton-flannel leggings reaching to just below the groin. The shirt may be omitted if the heat be excessive.

Preparation for Anesthetic.—For anesthesia, the stomach should be empty, false teeth should be removed, the hair should be braided, the lips and nostrils lightly smeared with cold cream or vaselin, and the clothing about the neck and throat perfectly loose.

Preparation of Room in Private House.—Many of these operations are performed in private houses, and due attention must be given to the preparation of the room. As clean and light a room as possible should be selected. It should be upon the same floor with the bath-room and closet, but preferably without plumbing connecting with the sewer. If a bed is employed, it should be narrow and high, with a firm, smooth mattress. It will add much to the comfort of the operator and nurse if a table be improvised, using a clean kitchen-table covered with blankets, a rubber sheet, and sheet. Unnecessary furniture should be taken out of the room if it be small. A number of basins and pitchers must be thoroughly scrubbed and rinsed with boiling water. The table should be so arranged that the best available light will fall upon the seat of operation. The nurse should

secure some means of holding the irrigator or douche-tube. A portable clothes-stand is very convenient for this purpose. A Kelly pad should be placed upon the table, and beneath it a slop-jar or a large pan to hold fluid. The lower half of the windows, if there is a possibility of observation, should be occluded by paper or other impervious material.

Sterilizer and Instruments.—Physicians often have their instruments and dressings sterilized in a hospital in a portable sterilizer. This can be taken to the house of the patient and not opened until the time of operation. Other physicians bring their instruments in sterilizing trays, boiling them just before the operation. If neither of these devices is used, the nurse may be required to boil the instruments in the cleanest available pan or basin. Brown soap and soda with plenty of boiling water will clean a basin sufficient to make it practically safe. A teaspoonful of soda to a quart of water should be used to boil instruments, to prevent rust and injury to the instruments. If the physician is to use the cautery, the nurse may be expected to assist in its management. She should be informed of this and told exactly what she is to do before the operation commences.

Needles and Sutures.—These should be sterilized and prepared as the physician desires, and it is well to separate them from the other instruments in a different basin or pan. If the nurse is familiar with the operation and the operator, she will know regarding the number of sutures probably required and their kind.

Solutions and Stimulants.—Antiseptic solutions as ordered must be in readiness, with a plentiful supply of hot water. The nurse must take especial care that antiseptic solutions are not left in a private house. Chil-

dren or servants may mistake them for water or for some harmless substance, and cases of poisoning have arisen from this source. This is especially true of white tablets of mercuric chlorid, which a child might mistake for candy. The nurse remaining in charge of the patient can take care of antiseptics while she is with the patient, and when she goes any remaining should be destroyed or given in the care of the mother with suitable caution. The nurse will be expected to see that whiskey or brandy is available during the operation. Private patients sometimes offer wine as a substitute, but this should not be accepted.

The nurse should see to it that a plentiful supply of clean linen and such surgical dressings as the physician requires are on hand. With good care a nurse can save the patient's linen while still keeping her perfectly clean. Old sheets if thoroughly clean should be used for operations, and often by tearing a large sheet in halves these can be used for wrapping the patient's limbs much more conveniently than the larger sheet. As linen used for an operation may be stained by antiseptics, the best linen should not be selected for this purpose. Sterile or antiseptic vulvar dressings and sterile or antiseptic gauze pads will be required. Strips of sterile gauze for packing should also be in readiness. The physician sometimes brings gauze in sealed glass jars, and in other cases relies upon gauze sterilized and wrapped in sterile towels. While sterilizing the instruments the nurse should boil a half dozen towels, which may be wrung out and kept for handling sterile gauze.

Operations of this Sort in Hospitals.—These operations are usually performed in the general operating-room or the minor surgical operating-room of hospitals.

As the portions of the body operated upon are rarely in a perfectly aseptic condition, it is better to perform such operations in a different room from that in which abdominal surgery is practised.

The After-care of these Patients.—From two weeks' to one month's rest in bed is required after these operations. During the greater part of this time the nurse must apply surgical dressings to the vulva or anal region, retaining them in place by a T-bandage. The use of a catheter is often necessary with these patients. The bowels must be moved by enemas, and very frequently lavage of the intestines must be practised in addition. Vaginal douches are often required during convalescence. The diet as ordered by the physician must be nourishing and easily digestible, and the general care of the patient must be that given to all surgical cases. Surgeons often utilize the opportunity while the patient is in bed to build up the general health of the patient in every possible manner. Selected feeding, massage, electrical treatment, tonic drugs, are all employed to bring about the best general result. The nurse who cares for these patients must add to her surgical knowledge the thorough understanding of the best medical nursing.

CHAPTER VII.

OPERATIONS IN WHICH THE PERITONEAL CAVITY IS OPENED.

The peritoneal cavity is opened through the abdomen by the performance of celiotomy, or abdominal section. It may also be opened through the vagina by an operation often termed vaginal celiotomy.

NATURE'S SAFEGUARDS.

In order to understand the care of the patient for one of these operations, the nurse should know something of the way in which Nature protects patients against the dangers to which they are exposed. The peritoneum, a delicate membrane of large extent, is easily wounded or infected and yet recovers very quickly under favorable conditions. The cells of this membrane and the blood-cells circulating through it are capable of absorbing a considerable quantity of foreign and poisonous matter, and destroying it. Wounded surfaces in the peritoneum heal very quickly. In order for these safeguards to be most efficient, the patient must have a naturally sound and healthy blood, and sound blood-vessels, while the lymphatic channels in the peritoneum and bowels must be comparatively empty. The kidneys must also be healthy, to perform their usual duty.

To bring about this condition we strive to have patients in as good general health as possible before the perito-

neum is opened, while we empty the lymphatic channels by actively purging the intestine. We further contract the intestine to its smallest bulk, so that it shall not impede the operation, and so that it shall be in as little danger of injury during the operation as possible. The kidneys are prepared by copiously flushing them through the water which the patient drinks, while the skin receives attention by baths and massage.

PREPARATORY TREATMENT.

Preparatory treatment is often necessarily prolonged. If a patient has had a disease for a number of years which has been interfering constantly with a healthy condition of the abdominal organs, this state of disease cannot be remedied at once. In emergency cases the patient loses the great benefit of preparatory treatment, and the operator must take the chances in view of the greater danger which renders the emergency operation imperative.

THE DANGERS OF CELIOTOMY, ABDOMINAL OR VAGINAL.

The great dangers of these operations are from hemorrhage and septic infection. Both through modern science are largely preventable, and in the prevention and detection of each the nurse has an important duty and responsibility. As she often prepares ligatures to control hemorrhage, she should detect a weakened ligature and report the fact to the physician. As the aseptic preparation of the patient is largely committed to her, if she is not faithful in her work the patient may become infected. The same responsibility attaches to the preparation of dressings, of pads and gauze sponges, and all

articles used about the patient. Instruments or sponges left within the abdominal cavity have caused death, and this mistake has occurred through an error on the part of the nurse in charge of the sponges and instruments. In view of these dangers we must remember the importance of absolute quiet immediately after such an operation. Such reduces the tendency to hemorrhage to the lowest point, and favors the healing process going on in the peritoneal cavity, and the establishment of those functions of absorption and elimination upon which the patient's recovery may depend. In many cases the fate of such a patient is decided in the first forty-eight hours after the operation. We can thus readily understand why it is the duty of the nurse to keep the patient absolutely quiet.

PRELIMINARY TREATMENT.

Whenever possible, a case requiring opening of the peritoneal cavity should come under observation from two to four weeks before the operation. The patient should be put at rest in bed, and may be allowed to use a commode, or, if a bath-room be convenient, to use it. Specimens of urine should be sent to the physician for examination as often as he may desire. An accurate record should be kept of the pulse, temperature, hours of sleep, amount of food taken, the number of bowel movements, and the amount of urine voided. The diet of the patient will be such as to put the digestive tract in the best condition for operation. It will usually consist of nourishing liquid diet in small quantities, at comparatively frequent intervals.

The Bowels.—The bowels of the patient must be very thoroughly emptied by such medicines as the

physician will prescribe, by copious enemas, and by intestinal lavage. In some cases intestinal massage will be ordered, while in others it cannot be employed. Unless a nurse has had experience, she cannot appreciate the quantity of fecal matter which a patient having a large tumor may retain in the intestines. In the writer's observation over forty bowel movements in two days, with repeated enemas and lavage, were found necessary to empty the bowels in such a case. The use of injections containing ox-gall or oil or glycerin is often necessary. In some cases the knee-chest posture must be utilized to secure the best effect for such injections. The effort to empty the intestines may result in the formation of large quantities of gas. This is simply an indication that the necessity for cleansing the bowel is very great. The treatment should continue in such a case until the gas has entirely disappeared. When the patient's intestinal tract is in sound and healthy condition the tongue is clean and pink, the abdomen is soft, and the intestines are free from gas.

The Skin.—Attention to the skin is also needed in these cases. In many patients it is well to put them between blankets instead of between sheets during this treatment. A thorough soap-and-water sponge-bath once daily, and an alcohol-and-water sponge-bath at night, are indicated. Excessive sweating or failure to react are unfavorable symptoms, and should be reported to the physician.

The Kidneys.—The action of the kidneys will be stimulated by the regular and free use of water, and by such medicines as the physician may prescribe. The amount of urine should be measured and recorded, and the record reported to the physician. Any unusual

appearance in the urine should also be recorded and reported. The urine will be examined.

The Pulse.—While the nurse is giving the patient this preliminary treatment she will have opportunity to observe the condition of the pulse and to judge somewhat of the state of the heart. While it is not her province to examine the heart critically, she should notice a tendency to faintness or palpitation of the heart, a very small, feeble pulse or a full, hard, and bounding pulse. She should notice intermittence of the pulse when she takes the temperature and pulse daily.

Duties and Province of Nurse.—The nurse is with the patient more than the physician, and hence has greater opportunities for noticing. It is not her business to decide or to diagnosticate or recommend treatment, but she can never go wrong in noting any symptom, in recognizing its importance, and in reporting it promptly. An accurate diagnosis in cases of intra-abdominal disease is often difficult and sometimes impossible. A conscientious physician may repeatedly examine a patient, and will require all the help which the diagnostic art can give him to decide accurately the condition. Hence it is important that the nurse should be accurate and careful in her observations, and faithful and prompt in her report. She has also a further province in coöperating with the preparatory treatment, and that lies in the mental condition of the patient. In cases of chronic disease the patient through her suffering and disability has been finally brought to risk the chance of death to obtain relief. Some women are hopeful and calm in this condition, while others are apprehensive and timid, and others profoundly melancholy. They welcome encouragement and sympathy; and while the nurse should

never become sentimental, still her knowledge of medicine is such and she sees so many successful cases that she can greatly encourage the patient in the hope and belief that her operation will be successful. A nurse should never forget that serious interference with the human body is a grave matter. Under no circumstances should the nurse become flippant in speaking of an operation or its results. A nurse who loves to describe the scenes of the operating-room to patients, and to boast or joke about them, should not be employed. Such a person does infinite harm to her profession and to herself. If a patient is curious regarding the details of the operation, the nurse should not satisfy her curiosity. Under no circumstances should any remark made by the patient while under ether or any untoward happening during the operation be repeated. By her quiet, courageous, kind, and hopeful demeanor, and by her steady and prompt performance of her duties, the nurse can play a very important part in the preparation of patients for abdominal operations.

OPERATING-ROOMS.

In well-equipped hospitals operating-rooms are set aside especially for cases requiring abdominal surgery. Such rooms are not necessarily large, but they should contain those appliances most used in these operations, and should be free from the danger of contamination which often arises where miscellaneous operations are done. If an abdominal section proves to be for septic disease, a small room can be readily fumigated and should be thoroughly aired afterward. Such a room must be so constructed as to be readily made aseptic and to stand the wear of frequent cleansing. Its walls, ceil-

ing, and floor should be hard and smooth, capable of repeated flushing or scrubbing with alkalies and antiseptics. There should be no angular corners or projections in the room to favor the accumulation of dirt. The room should be ventilated directly to the outside air, or into an independent flue which has connection with no other flue. It should be heated by the circulation of hot water through pipes or by steam, but not from a furnace and registers. An open fire with a large flue is especially useful. A north light is preferred by many for such a room, while gas and the electric light should both be in readiness. An accident suddenly shuts off the electric light at a most important time, and hence the necessity for having two sources for artificial light. No pipe connecting with a sewer should open into an operating-room. The effort has been made to drain such rooms by making the center lower than the sides, and by the use of a large pipe opening in the center of the room. This effort has rarely been followed by satisfactory results, as the pipe becomes clogged and fluid accumulates in the room. It is now considered best not to attempt to drain the floor of an operating-room, but to mop up fluid and other material which requires removal.

Anesthetizing-room.—An operating-room should have adjoining to it several small rooms of various sizes; one communicating with the corridor or hall may be devoted to anesthetizing patients, so that the patient need not witness the preparations for the operation which may be going on in the operating-room. Such a room should be provided with a suitable bed, unless it is preferred to anesthetize the patient on a wheeled stretcher, thus preventing an unnecessary transfer. The anesthetizing-room should be well lighted and heated, and equipped

with stimulants, oxygen, and an electric battery. Inhalers, tongue-forceps, mouth-gag, and tracheotomy set may also be kept in this room.

Sterilizing-room.—It is also customary to have a room for sterilization, adjacent to the operating-room. In this may be placed several large steam sterilizers, one for instruments, one for dressings, and one for linen. These must be connected with steam apparatus or some other form of apparatus which supplies steam or heat. It is usual to place one nurse in charge of the sterilizing apparatus and the preparation of sutures, ligatures, antiseptics, and dressings. She is thus responsible for the proper condition of these articles.

Store-room.—Adjacent to the room for sterilizing there may be conveniently a storage room in which drugs and medicines required, sterile dressings in packages, antiseptics, and other supplies may be kept. The nurse in charge must be careful that this room does not become a repository for unused and useless articles. Its shelves should be small, kept under lock and key, and its supplies limited strictly to objects of practical value.

Recovery-room.—On the opposite side of the operating-room from the anesthetizing-room there should be a room in which patients may recover from the anesthetic after an operation, before they are transferred to a private room or ward. In some cases a patient is too ill to be immediately moved, and in other cases the operation may be so slight that the patient may return to her home when she recovers from the anesthetic. This room should contain one or two beds, should be well lighted and warmed, should contain stimulants, oxygen, and an electric battery, and the few instruments required for drawing out the tongue and resuscitating the patient

after an anesthetic. Hot-water bottles or hot cans should be available in this room, with a plentiful supply of hot water.

Doctor's Dressing-room.—At a convenient distance from the operating-room there should be a dressing-room and room with bath for the use of the attending physician. This should be furnished with the conveniences of a dressing-room.

APPARATUS.

Sterilizers.—A most important part of operating-rooms are the sterilizers. These are selected by those who equip operating-rooms with reference to the size and sort of sterilizer, and also with regard to the question of steam or the use of gas as a means of sterilization. A

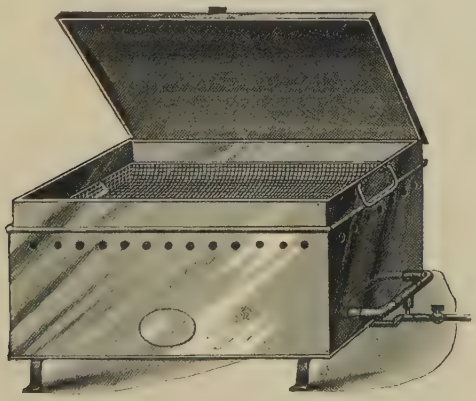


FIG. 83.—Schimmelbusch's sterilizer for boiling instruments in soda solution (Fowler,

nurse placed in charge of such apparatus must endeavor to understand the way in which it works, and be especially careful that so far as she can bring it about the apparatus is kept thoroughly clean and in good condi-

tion. Several sterilizers are necessary in operating-rooms where many operations are performed. There should be one for instruments, one for dressings, and one for linen

FIG. 84.—Arnold steam sterilizer (Fowler).

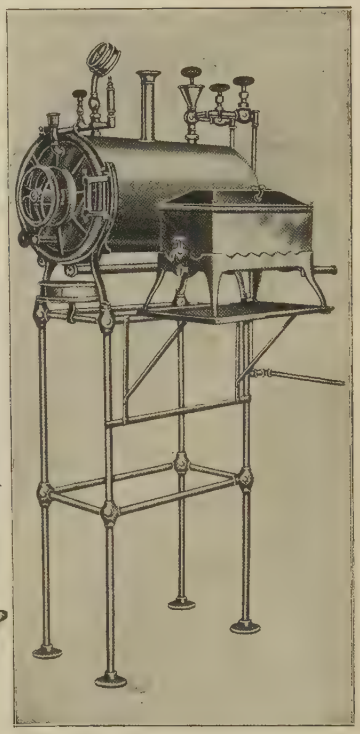


FIG. 85.—Small steam-pressure sterilizer and instrument boiler (Fowler).

and blankets. Each will be equipped with appropriate trays or baskets, in which the articles to be sterilized will be placed.

Linen.—A supply of especially selected linen, in addition to antiseptic dressings, must be at hand in each operating-room. While but few sheets and pillow-cases are needed, still some are required, while the towels used

for the physician's hands and sometimes for insertion within the abdomen should be made of proper and convenient size. Ordinary sheets and blankets are entirely too large for use in surgical operations, and result in great inconvenience to the nurses and operators in charge of the case. Hence especially selected linen made of dimensions desired should be prepared.

Operating-table.—The operating-table should be equipped with an attachment to give the Trendelenburg

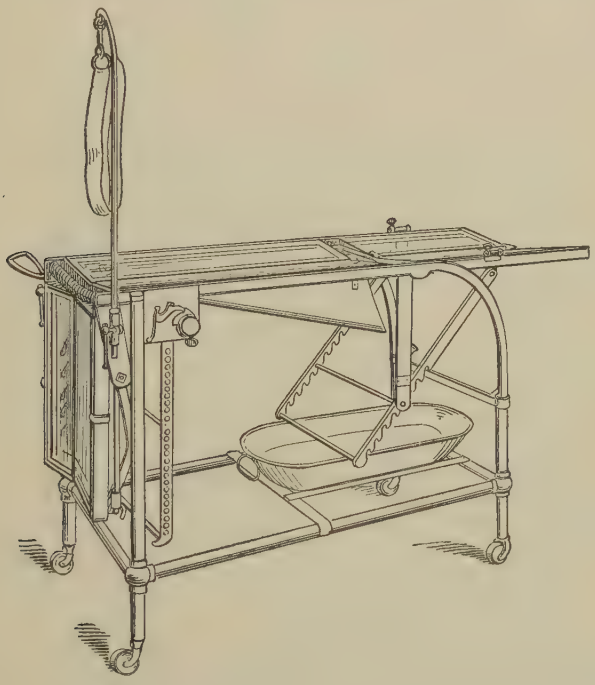


FIG. 86.—Boldt's hospital examining and operating table. Showing an adjustable stirrup with strap and a heel stirrup (Ashton).

posture, which can be operated easily and by simple means. Glass and iron are the best materials for the

making of operating-tables, while upon the legs of the table rubber tips should be placed.

Stands, Basins, and Trays.—There should be a number of portable stands made of glass and steel, and mounted upon rubber wheels or tips, upon which may be placed basins, pitchers, trays, and other objects. These are usually made for each operating-room in accordance with the wishes of the Staff. Basins are usually of agate or enamelled ware, occasionally of block tin or of copper. Several kidney-shaped basins are very useful, and should be made of copper. Trays or pans for instruments are of thick glass, porcelain-ware, or agate-ware. The glass and porcelain are better. A large glass or porcelain bowl in a stand is very convenient to place at the side of the operating table, so that the operator may rinse his hands in it during the operation. Movable stands should be upon rubber wheels.

Wash-stands.—For cleansing the hands, wash-stands so arranged that they are emptied by a pipe which does not go to the sewer nor to any other sewage pipe are desirable. These wash-stands may have various devices for the turning on and off of water. Those in which the water can be turned on and off by pressure with the foot are most convenient, as in this way the hands do not come in contact with any object which is not sterile during cleansing. There should be receptacles for soap, antiseptics, and sterile nail-brushes.

Instrument-cases.—These should be constructed of iron and glass, the iron being painted with enamel paint or nickel plated. They should be kept locked when the instruments are not required. Care should be taken that the instrument case is completely dry and air-tight. In some cases a simple apparatus is inserted

showing the degree of moisture which may be present within the case.

Oxygen Apparatus.—One or two cylinders containing oxygen, with the apparatus necessary for inhalation, should be at hand. This apparatus should be examined at frequent intervals in order that any flaw or leakage may be detected.

Instruments for Transfusion.—Canulæ suitable for insertion into the veins, sterile rubber tubing, sterile glass funnels and scalpel, dissecting forceps, several hemostatic forceps, needles, needle-holder, and sterile normal salt solution should be constantly on hand for the performance of transfusion. It is well to have these

FIG. 87.—Instruments and apparatus for saline intravenous transfusion.

instruments ready in a small sterilizing pan so that they can be boiled in a few moments. If sterile salt solution has not been prepared, it may be readily made by using a standard solution whose strength is known or by adding a teaspoonful of salt to a pint and a half of hot water.

Electrical Apparatus.—In addition to the ordinary electric lights a group of these should be placed over the operating-table, and small electric lights should be available for throwing light directly into the abdominal cavity. In some cases the operator prefers to wear a small electric light upon the forehead, retained in position by a band. A Faradic battery should also be at hand in operating-rooms. It is sometimes a useful appliance in the

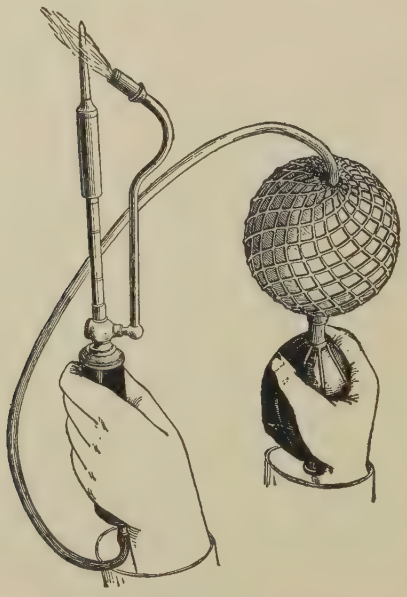


FIG. 88.—Paquelin thermocautery.

resuscitation of patients from collapse, hemorrhage, or shock. An electric cautery and Roentgen ray apparatus may also be available. Electrical appliances for conveying heat to the body of the patient are most efficient and useful. An electrical pad upon which the patient may

lie will furnish equable and constant heat and is of great value in severe operations upon debilitated patients.

Miscellaneous Furniture.—A reliable clock with plain face should be at hand, so that the time can be seen without referring to watches. For the anesthetizer a stool is needed, and a small stand upon which may be placed the instruments and stimulants which he may need. An irrigator upon a stand and upon rubber wheels may be used, although many operators prefer to pour fluid into the abdomen from pitchers. Glass jars, wide but not very high, with screw tops, are needed for the storage of sterile dressings and abdominal pads. If these are too high, they are cleaned with great difficulty. Quart pitchers of the best quality of agate-ware should be in abundance, and slop-buckets of the same material should also be used. If the room is used by several operators and there is a considerable difference in height between them, a foot-rest or grating may be necessary for the use of the shorter men. In some operating-rooms a black-board is placed where it can be conveniently seen by the operator. This is for certain memoranda regarding instruments, sponges, or pads. Stretchers employed to convey patients to and from operating-rooms should be well balanced and run smoothly upon rubber-tired wheels. A stretcher should be sufficiently large so that, if desired, a patient may be anesthetized on it. There should be no chairs in operating-rooms. No one has occasion to sit in an operating-room except the anesthetizer, and for him a stool is provided. An unnecessary number of tables should also be avoided, because tables, chairs, large cases, cupboards, and closets further the accumulation of articles which may collect dirt and infection. If those who use the operating-room study

the pathology of their cases, they may desire a sterile jar containing formaldehyd solution to be kept in readiness, in which tumors can be placed so soon as removed. A rack of sterile culture-tubes containing suitable media, with a platinum wire for inoculation, is also useful for bacteriologic examination.

PREPARATION OF OPERATING-ROOM AND FURNITURE.

To prepare an operating-room and furniture for use, it should be thoroughly scrubbed with green or brown soap and hot water, rinsed, scrubbed with solution of sodium bicarbonate and rinsed with hot water, and fumigated with formaldehyd and well aired. Some prefer scrubbing with lysol or carbolic acid, and some use mercuric chlorid, although this substance attacks metal furnishings and ruins plating.

IMPROVISED OPERATING-ROOM IN PRIVATE HOUSE.

Where it is necessary to improvise an operating-room in a private house a large, airy, and sunny room must be selected. Such must have no communication with the sewer, nor must it be immediately next a bath-room or closet. It should be ventilated, if possible, by an open fire with a large flue. From this room the carpet and hangings should be removed. All superfluous furniture, especially upholstered furniture, should be taken away. The floor and woodwork should be thoroughly scrubbed with scrubbing-soap or green soap and hot water, with solution of soda, with mercuric chlorid (1 : 1000) or lysol (1 per cent.). The nurse should place in the room such articles as will be required. The room should then be closed and thoroughly fumigated with formaldehyd. In this manner the room and its furniture are made as aseptic as possible. Before operation the room should

be well aired and suitably warmed. To prevent inspection, cheese-cloth may be stretched over the lower windows, or soap may be daubed on the glass.

IMPROVISED APPARATUS.

New agate-ware basins are best. China- and earthen-ware may be used if they be thoroughly scrubbed, rinsed, and again scrubbed with bichlorid solution. It is seldom possible to obtain agate-ware pitchers in private houses, and earthen-ware toilet pitchers may be used if suitably cleansed. A new wash-boiler answers an excellent purpose as a sterilizer if none other is available. A large new kettle may also be used. Old linen should be torn into convenient size and thoroughly sterilized by boiling. Flannel for bandages may be similarly prepared. Unless ample time is given in which to prepare towels, unless they are thoroughly clean before boiling, they may be viewed with suspicion. It would be better to prepare an abundance of cheap sterile cheesecloth rather than to trust to towels. Cheesecloth may be made ready for this purpose by soaking it in a 1 per cent. solution of soda, thoroughly boiling it for one hour, rinsing it, and if it is desired to impregnate it with mercuric chlorid, soaking it in a solution of 1 : 2000 or 1 : 1000. It may then be wrung out and dried, when it is available for use. An operating-table may be improvised with a kitchen-table, and smaller tables and stands required should be selected. As they cannot be scrubbed if varnished, they should be covered at the time of operation with linen or cheesecloth wrung out of bichlorid solution (1 : 1000). The nurse should impress upon the family the fact that while preparing for the operation and during the operation an intelligent person must keep a good fire in the range or stove, so that hot water may be ready in abund-

ance. If jars are required and cannot be readily obtained, new clean butter-crocks which have never been used may be readily prepared, and serve a useful purpose. If there is not an abundance of pitchers, sterile water may be stored in these, the crocks being covered by sterile or bichlorid gauze. Several new clean pails or buckets should also be available. This apparatus is to be prepared by thorough scrubbing, and then by fumigation in the operating-room.

DRESSINGS AND SOLUTIONS FOR CASES IN PRIVATE HOUSES.

It is usually necessary for the nurse to be with her patient for several days in a private house before an operation. This gives ample time for preparation, which the nurse may utilize for sterilizing suitable material for dressings. The doctor may prefer to bring with him dressings properly prepared.

EMERGENCIES IN PRIVATE HOUSES.

When sufficient time is given to preparation good results may be obtained from operations in private houses. The element of risk, however, is distinctly greater, while the labor expended in suitable preparations for an operation in a private house is rarely appreciated or realized by any one but the nurse and operator. Cases are occasionally seen in which some very grave emergency arises, for which a patient must be operated upon in a private house as soon as possible. Here the best that the nurse can do will be to prepare the site of operation as promptly and thoroughly as possible, to to have on hand an abundance of boiled water, and to try her best that all which comes in contact with the patient shall be thoroughly clean.

CHAPTER VIII.

IMMEDIATE PREPARATION FOR OPERATION.

STERILIZATION OF THE HANDS OF PHYSICIANS AND NURSES.

A NUMBER of methods are available for the sterilization of the hands. No one can be said to be entirely satisfactory, but several are practically successful and have borne the test of considerable experience. The methods most used are the following:

That of Fürbringer is essentially as follows: After thorough preliminary cleansing of the nails and scrubbing the hands and arms with soap and water and rinsing in boiled water, the hands and forearms are immersed in absolute alcohol for one minute, and are then rapidly transferred while wet to a hot solution of mercuric chlorid (1 : 1000), and thoroughly scrubbed with a nail-brush. This scrubbing must be kept up for not less than one minute, the nails being especially cleansed. When the hands and forearms touch an object not aseptic, they must again be immediately washed in bichlorid solution.

Another method is that of Schatz, which has been extensively used and described by Kelly. This method is used by him as follows: The hands and forearms are vigorously scrubbed with a good nail-brush, with brown kitchen soap or green soap and hot water, for ten minutes. The nails must be cut short, and the spaces between the fingers and the nails must receive especial attention. The water should be changed several times in which

this scrubbing is done. From ten to five minutes are requisite for this scrubbing. The hands and forearms are next immersed in a hot saturated solution of potassium permanganate until stained a deep-mahogany color. They are then immediately transferred to a saturated solution of oxalic acid as warm as it can be conveniently borne. This decolorizes and sterilizes them. The oxalic acid can be removed by rinsing the hands in warm water or in sterilized lime-water, which at once neutralizes the acid. Should the hands or arms come in contact with objects not sterile, vigorous scrubbing for ten or fifteen seconds with a fresh brush is necessary.

A third method is that employed by the surgeons of the New York Hospital, as follows: Scrub thoroughly with hot water and green soap, cleaning about and beneath the nails. A scant tablespoonful of commercial chlorid of lime is put in the palm and a piece of sodium carbonate one inch wide and one and a half inches thick. A little water is added to make a thick cream. This is rubbed into the palms, hands, and arms until it is perfectly smooth and there is a sense of coolness in the palms. It should be well rubbed under and around the nails. From three to five minutes are necessary for this. The hands are then washed with sterile water. If any odor persists, it may be removed by a dilute solution of ammonia-water.

In the experience of the writer the following method of caring for the hands and sterilizing them has proved satisfactory. Daily attention by those who operate or assist should be given to the care of the hands. The nails should be kept of proper length, hang-nails should be carefully trimmed out, and all roughened or unhealed surfaces should be detected and remedied. Persons

differ with regard to the susceptibility of the skin to different antiseptics. Thus some persons can use bichlorid solutions with but little irritation, while others are unable to do so. If there is a tendency to roughness or abrasion, an application may be made each night before retiring of some simple antiseptic ointment or lotion, such as bay rum and glycerin (equal parts), or lanolin to which has been added boric acid (ten grains to the ounce). If the hands stain the bed-clothing, cotton gloves may be worn, which can be cleansed by boiling. The selection of nail-brushes is a matter of importance with regard to the cleansing of the hands. Good brushes are simple in construction, not too large, and with stiff and efficient bristles. Some forms of grass are used in place of bristles, and make excellent nail-brushes. Nail-brushes should be sterilized by thorough boiling, and when not in use should be kept in a solution of carbolic acid (2 per cent.) or lysol (1 per cent.). Cheap brushes are quite sufficient, and should be burned after each septic or doubtful case. In cleaning the nails a sharp blade should not be employed. This roughens the under surface of the nail and favors the accumulation of dirt. The nails should be cleaned with a smooth point of ivory, pearl, or wood. Sticks of orange-wood are very useful for this purpose. In brushing the hands the fingers must be separated as widely as possible, and the spaces between the fingers receive especial attention.

It is our habit to scrub the hands and forearms thoroughly, after the nails have been suitably prepared, with green soap and hot water, this scrubbing to last between five and ten minutes. It is not so much the number of minutes as the thoroughness of the scrubbing which is essential. The hands and arms are then scrubbed in hot

sterile water with a separate and sterile brush. They are then scrubbed in alcohol and quickly transferred to a solution of mercuric chlorid (1 : 1000) and scrubbed again. They are then thoroughly rinsed in alcohol a second time, and just before the abdomen is opened are scrubbed again in hot normal salt solution.

Gloves.—The introduction of gloves by Halsted and Mikulicz has given us a very convenient resource in septic and doubtful cases. Cotton or thread gloves have been tried, but are not as satisfactory as rubber gloves. These are of two kinds, the seamed and the seamless. The latter are preferable. Well-made rubber gloves may be sterilized by boiling, and with good care will last for a considerable time. Oily substances and alkalies should not be applied to rubber gloves. When not in use they should be thoroughly dried by turning inside out, and sterilized gauze may be packed into the fingers and palm to prevent a possible sticking together of the surfaces. When the gloves are to be used many operators prefer to put them on when thoroughly dried; others fill them with an antiseptic solution, raising the hand and allowing the solution to escape as the glove is put on; while others lubricate the hand with sterile glycerin before applying the glove. If the hands are sensitive, the sterile glycerin is very healing. A nurse who assists at operations should accustom herself to the use of gloves, as many operators prefer that those nurses who touch dressings, sutures, or instruments should wear them.

ANTISEPTIC COVERS FOR JARS AND TABLES.

To maintain asepsis, we must not only cleanse the hands, but we must also avoid touching objects which

are not aseptic. In an emergency it is often necessary to open a jar containing dressings or surgical supplies the cover of which is not aseptic. Danger may be prevented by touching such a cover with a pledget of bichlorid gauze, which the nurse takes in her hand before she approaches the jar. If jars and tables be covered with wet bichlorid gauze just before the operation, the nurse can lift off the cover of the jar or touch the top of the jar without danger. In some operating-rooms a nurse whose hands are not sterile but thoroughly clean is kept in the operating-room during an operation, to touch and handle such objects as are not sterile. She is sometimes called in joke "the dirty nurse."

PRELIMINARY PREPARATION OF THE ABDOMEN AND VAGINA.

On the day before the operation, or earlier if the physician orders, the surface of the abdomen, the vagina, and the tissues about the labia should be suitably prepared. As this is a very responsible matter, the physician should give the nurse written directions or should dictate them to her for this procedure. Patients differ considerably in the ease or difficulty with which the surface of the body can be made aseptic. In fat patients the folds of the tissues about the groin and the deep umbilicus make preparation very difficult. In persons with sluggish, greasy skins it is also a hard matter to get them clean. In thin persons with rather delicate skin the task is much more easy. Especial attention in cleansing must be given to the umbilicus and to the groin and pubes. The pubic region should be shaved, and the region of the vulva should be shaved or have the hair closely clipped. Having thoroughly cleansed her own

hands, and placing the patient in the dorsal position with the thighs flexed, the nurse should thoroughly scrub the anterior surface of the body from the tip of the breast-bone downward to the middle of the thighs with green soap and hot water, using a good nail-brush and taking at least ten minutes for this scrubbing. The inner aspect of the thighs, the groins, the pubes, and the tissues about the vulva and labia should be especially thoroughly done. If the brush cannot be borne in sensitive portions, pledgets of gauze or cotton may be used for scrubbing, held in dressing-forceps or in the hands. In cleansing the umbilicus small bits of cotton should be carried well into this portion of the body, and the parts should be thoroughly scrubbed by rotary motion. When these surfaces have been rinsed in warm boiled water they should then be cleansed with alcohol or with ether, and then with mercuric-chlorid solution (1 : 1000). A large pad or dressing of mercuric-chlorid gauze should then be firmly and smoothly bandaged upon the abdomen and thighs by a broad flannel bandage. If the vagina is to be prepared, it should be done by scrubbing with pledgets of cotton with green soap and hot water or tincture of green soap, followed by copious douching with hot water, and then with mercuric-chlorid solution (1 : 2000) or lysol (1 per cent.). Before making this preparation it is well to empty the intestine thoroughly by a copious enema. In cases in which the skin is excessively thick and oily some operators have applied to the abdomen several nights before the operation a poultice or paste of green soap. This is removed on the following day and the preliminary cleansing carried out.

Iodin Method.—Many surgeons at present prefer to rely upon iodin as an antiseptic agent in preparing the

skin for abdominal section. If the patient is under observation the day before the operation, soap and water may be used with a sterile brush, followed by sterile water and the application of alcohol. When the skin is dry, 2 per cent. iodin is applied with a camel's-hair sterile brush, and the abdomen covered with sterile dressings. On the morning of the operation a 2 per cent. iodin solution is again applied.

Emergency Preparation.—Where operations must be performed as soon as possible, with little time for preparation, the abdominal region should be shaved as quickly as possible, and 2 per cent. iodin applied with a camel's-hair brush or gauze sponge, making two successive applications, and covering the skin thoroughly with the iodin solution.

FINAL PREPARATION.

Just before the operation, and often while the patient is anesthetized, the abdomen is again scrubbed thoroughly with green soap and hot water, rinsed with hot sterile water, cleansed with alcohol or ether, mercuric chlorid, and hot sterile water. The vaginal cleansing is again repeated at this time.

Catheterization.—Before the patient's limbs are secured to the Trendelenburg attachment of the table, and at the time when the final preparation is made, the patient should be catheterized with a sterile glass or soft-rubber catheter. The tissues about the meatus should be thoroughly cleansed with sterile water and bichlorid solution (1 : 2000).

The Rectum.—At this time the rectum should be copiously douched with normal salt solution, and the rectal tube allowed to remain until the fluid has escaped.

In some cases operators prefer to have several ounces of the normal salt solution left in the rectum for absorption.

Sterile Coverings.—The anterior surface of the body should be entirely covered by sterile material; the leggings put upon the lower extremities should have been sterilized, sterile towels should be placed over the chest and at the sides of the body, and over the surface of the abdomen should be laid a broad sheet of sterile gauze. Some operators prefer that this be made in several thicknesses lightly quilted together. Before opening the abdomen the operator will make an incision into this gauze with sterile scissors, exposing a surface sufficiently large for his purpose.

Placing the Patient upon the Table.—Before the final preparation and the application of the sterile covering the patient is placed upon the operating-table, and when the final preparation is complete the limbs are bandaged to the Trendelenburg attachment of the table and the patient is placed in proper position. The shoulder supports should be carefully adjusted, and if they are efficient, it may not be necessary to tie the limbs. It is essential that the arms be protected from injury if the patient is to be in the Trendelenburg posture. The forearms should be bent upon the arms and the hands carried up to the region of the shoulders, where the sleeve of the patient's jacket may be pinned to the side of the jacket. The arms should not be put in a constrained position, and care should be taken that the arms do not fall under the raised portion of the operating-table. Such an accident has happened, and when the table was let down the arm has been severely bruised by the table.

Counting Pads, Sponges, and Instruments.—While the patient is being prepared, the instruments,

having been sterilized by boiling, are placed by the first assistant in sterile trays, and are covered with sterile water, normal salt solution, or 1 per cent. solution of carbolic acid. These trays are placed upon a suitable stand within convenient reach of the operator and assistants. The nurse in charge of pads, sponges, and instruments should be sure of the number of pads, sponges, needles, and hemostatic forceps which are employed. It is a good plan to put upon the blackboard the title of the operation, the date, the hour, the number and kind of pads, sponges, hemostatic forceps, and needles employed. If this is not done, the nurse should make a list of them and place the list before her where she can readily see it.

Arrangement of Apparatus.—The instruments being placed in position, a large bowl of normal salt solution or sterile water is placed in convenient position for the operator in rinsing his hands. Needles, sutures, and ligatures are put upon a stand in charge of a nurse or assistant. Sponges and pads are handed by a nurse, while the nurse in charge of the dressings is ready to furnish strips of gauze for packing or dressings as may be required. Normal salt solution for irrigation should be ready in abundance at any temperature. The apparatus for giving oxygen, the electric apparatus and cauterizing apparatus, if such be desired, should be in constant readiness. Apparatus for hypodermoclysis or for intravenous transfusion should be at hand. Suitable nozzles for injections into the rectum, with syringes, must also be ready.

THE ANESTHETIZER.

The anesthetizer should have within convenient reach a stand with two shelves. Upon the upper should be a

mouth-gag, forceps for drawing out the tongue, a collection of stimulants in a small case in plainly labelled bottles, and a good hypodermic syringe ready for use. On the under shelf of the stand may be a kidney-shaped basin in case the patient should vomit. A half dozen soft towels should be also available.

FIG. 89.—Surgeon's operating suit.

PHYSICIANS' CLOTHING.

Physicians are accustomed to wear at operations trousers, shirts, caps, and gowns of material which can be readily sterilized. To cover the entire face, caps are made with pieces going over the face in which apertures are cut for the eyes. The mouth and nostrils are usually left covered to prevent contamination from the expired air, and also from mucus in the nose and throat of the operator. Some physicians prefer not to use the complete face-mask, but to have a small piece of gauze tied over the mouth during the operation. In some instances attempts have been made to sterilize the shoes worn by operating surgeons. Such garments should first be washed thoroughly in the usual manner and then be sterilized with

sheets and blankets. A suit should be placed together, pinned in a sterile towel and suitably labelled, so that the physician may find it in readiness for any operation. Such packages should be placed in the dressing-rooms for the Staff.

DRESS FOR NURSES.

Dresses worn by nurses in operating-rooms should be washed and sterilized after each operation. The nurse should wear shoes which give her a sure and easy tread. Felt slippers in which cork soles are placed, or rubber-bottomed canvas shoes, known as "sneakers," with cork insoles, are useful. Under no circumstances should nurses in operating-rooms wear heavy and noisy shoes. As the floors of such rooms are smooth and may be wet and slippery, the nurse might fall and injure herself if she were not provided with suitable shoes. Many operators prefer to have nurses abandon the usual cap, and wear in its place a cotton or linen skull-cap covering as much as possible of the hair. Sterile gowns should also be in readiness for the nursing staff of an operating-room, and clean rubber aprons may be worn beneath the sterile gown if needed. Rubber aprons are not comfortable, however, but very hot, and nurses usually prefer to avoid them if possible.

DISCIPLINE OF THE OPERATING-ROOM.

The clinic nurse or nurse in charge should be in absolute control of the nurses. Next to her in responsibility are the nurses who prepare the patient and have charge of the sponges, pads, hemostatic forceps, and needles. Each nurse who has anything to do with an operation has a great and decided responsibility, and must be im-

pressed with this fact. To each a definite duty must be assigned, and she must be held strictly responsible for the performance of such duty. It may be necessary for the nurse in charge to inspect the hands of the others from time to time to see that they are in proper condition. The smallest number of nurses who can do the work will succeed far better than too many. Talking has no place during an operation, and only necessary communications should pass between nurses at such times. In addition to the nurses, an orderly may be very useful in an operating-room. Such a man should be, if possible, habitually sober. He should be under good discipline, and impressed with the fact that he is to touch nothing unless ordered to do so. He should wear noiseless shoes and duck trousers and jacket. He may assist in lifting patients, in managing the stretcher, in emptying buckets, and in lifting any considerable weight. He should be under the orders of the chief nurse. The orderly may also swab and clean the floor, walls, ceiling, and furniture of the operating-room, if he does this under the immediate supervision of a reliable person in the nursing staff.

TRAINING OF NURSES IN OPERATIVE WORK.

To train nurses efficiently in this work, they may receive verbal explanations and instruction in classes and in personal lessons from the chief nurse. They should receive demonstrations regarding the growth of bacteria, and become impressed with the fact that these organisms exist and are living beings. They should have a simple and brief account of various operations, and should be carefully taught in the symptoms of hemorrhage and septic infection. They should be first allowed to attend

operations as spectators, and thus become accustomed to the sight of blood and have ample opportunity to faint several times without incommoding the operator or the operation. Pupil nurses may next be advanced to helpers, when they fetch and carry to other nurses without touching sterilized articles. They may then assist the anesthetizer, and may gradually be entrusted with the preparation of solutions, the care of ligatures and pads, and the preparation of patients. Like all other branches of nursing, some display for such work far greater aptitude than others and are more successful in it. The nurse who is easily excited and confused, and who is naturally inaccurate in her performance of duty, is not fitted for this branch of nursing.

CHAPTER IX.

AFTER THE OPERATION.

It is customary with many operators to have the pulse and temperature taken almost immediately after an operation. The patient is removed from the operating-table to her bed, which is suitably warmed by hot bottles and in which are hot bottles placed about the feet. If there is much shock, she may be permitted to lie between blankets, with the head low, turned on one side, the limbs extended or flexed, a large firm roll being placed beneath the knees. The room should not be too light, but not so dark that the color of the patient's face cannot be seen and her symptoms noted. The nurse who is to take charge of her after-treatment assumes control from the time the patient is placed in bed, and becomes responsible for her.

ARRANGEMENT OF THE PATIENT'S ROOM.

By some simple precautions the work of the nurse may be much facilitated and the comfort of the patient enhanced by a suitable arrangement of her room. It should be ventilated by an open fireplace and large flue; if the temperature demands it, an open fire should be kept constantly burning. A large screen is a most useful article, and should be placed between the patient's bed and the door. This makes it possible for supplies to be brought into the room unseen by the patient. Two screens are sometimes useful, one in front of the door

and one in front of the window. Both protect the patient from disturbance, and add considerably to her comfort and that of the nurse. One or two firm small tables or stands are needed. Apparatus for heating water in small quantities is very desirable, and a gas jet or Bunsen burner may be utilized for this purpose. The nurse should have a comfortable chair by the bedside, so that when her patient is quiet and dozes she may rest also. Servants or assistants should wait upon the nurse promptly, bringing her those articles desired and removing what must be taken away promptly. The nurse should have means of summoning aid at any time.

VOMITING.

If the patient be well prepared for operation, the tendency to vomiting is much lessened. Some operators have the patient's stomach washed out while still upon the operating-table, just before she recovers consciousness from the anesthetic. This is an excellent precaution and usually very efficient. Anesthetizers often place over the nostrils and mouth of the patient a piece of sterile gauze saturated in vinegar. This is said to lessen very much the tendency to vomiting and aid in the prompt return of the patient to consciousness. If vomiting occurs, the nurse should support the forehead of the patient with one hand, raising the shoulders slightly. Hot water in sips is allowed by most operators, and the patient may take sufficient so that she vomits easily and without straining. While vomiting is undesirable, retching is far worse, and the free taking of hot water may stop the latter by making the former easy. A nurse must have a small basin to receive the contents of the patient's stomach, and this should be emptied and placed

out of sight as soon as possible. Towels or napkins soiled by vomiting should be removed immediately. If vomiting be severe and uncontrollable by simple methods such as described, the physician must be notified, when he will prescribe appropriate treatment. He may order a mustard plaster or paste put over the pit of the stomach, a hypodermic injection of an anodyne, the rectal injection of a stimulant or sedative, the washing out of the stomach, or the administration by the stomach of medicine intended to empty the intestine. The attempt is sometimes made to control vomiting by the administration of bits of ice or iced champagne in teaspoonful doses. The writer's experience has not been favorable to this method of treatment. In our observation the use of ice distinctly predisposes to the occurrence of vomiting.

HEMORRHAGE AND SHOCK.

Within the first few hours after the conclusion of an operation signs of hemorrhage and shock may become apparent. The patient's pulse is rapid, feeble, and easily compressed; the breathing is sighing, panting, irregular, and with the upper chest; the color is pallid; the skin clammy; the patient complains of faintness, thirst, dimness of vision, restlessness, and often has pain in the abdomen. This array of symptoms should lead the nurse to send at once for the physician. She can do little intelligently before his arrival, because the danger is that the patient is bleeding from some vessel in the abdominal cavity, and that free stimulation which she might use would increase the flow of blood. Until the doctor arrives the nurse may place external heat about the patient's body, and quietly and without manifesting alarm may have preparations made for reopening the abdomen.

If the case occurs in a hospital, the chief nurse and nurse in charge of the operating-room must be notified at once. They will immediately have the operating-room warmed, summon the Staff, and make ready as quickly as possible. If the case be in a private house, the nurse must see that hot water in abundance is ready, that sterile gauze is prepared, and she must plan exactly what she will do if the physician determines to reopen the abdomen.

The Treatment of Hemorrhage after Abdominal Section.—In most cases the abdomen must be opened and the bleeding vessels caught and tied. At the same time the blood-vessels of the patient must be freely supplied with a circulating fluid to replace the blood which has been lost, as otherwise the heart will cease to beat. The reopening of the abdomen is accompanied or preceded by intravenous saline transfusion. Accordingly the nurse must be ready to prepare salt solution at a moment's notice in such a case. If the physician has the apparatus with him, he may open a vein, while otherwise he may practise hypodermoclysis of salt solution or direct the nurse to inject as much hot salt solution as possible into the patient's bowel. The reopening of the abdomen should be done as promptly as possible, clots turned out, the bleeding vessel tied, and the abdomen filled with hot salt solution. If this be not in readiness, boiled water will be used. When the wound is closed and dressings again applied the physician will use every means to bring about a favorable reaction.

The patient will be placed in bed with artificial heat about her, the foot of the bed will be raised at least four feet from the floor, hypodermic injections of stimulants will be given, and the limbs of the patient may be band-

aged. The nurse will be instructed to inject into the rectum normal salt solution (from six to eight ounces), or freshly made hot coffee (two ounces), whiskey (two ounces), and hot water (two ounces); while salt solution may be injected beneath the skin. If available, an electric battery may be used to stimulate respiration and the action of the heart.

Hemorrhage after abdominal section is a most serious complication. In a few cases the conditions are such that the operator does not think best to reopen the abdomen. He may believe that the patient's best chance lies in absolute quiet, stimulation, and the gradual formation of a large clot. But no matter whether the abdomen be opened or not, a very short time decides the fate of the patient. The nurse, while realizing the gravity of the situation, must not show alarm or fear, must keep her wits thoroughly in control, realizing the important things to be done and anticipating as far as possible the doctor's wants. If in a private house, the family naturally will be much alarmed, and should not be deceived regarding the existence of danger. They should, however, be told that there is every hope of a favorable issue. With prompt and wise treatment patients are literally rescued from death in these cases.

Care during Convalescence.—Patients who have suffered from hemorrhage after operation require especial attention during convalescence. They should be kept in the recumbent posture much longer than others, their food should be carefully selected, and the most digestible and nutritious, and tonic medicines are usually prescribed. Massage, salt sponging, inunctions with olive oil, electricity, and occasionally the inhalation of oxygen, may be employed. The reason for caution in assuming the

upright position lies in the fact that occasionally patients who have suffered from hemorrhage form clots about the heart if they suddenly assume the upright position, which may prove fatal. These patients sometimes suffer severely from headaches which are caused by their anemic condition.

SEPTIC INFECTION.

This complication develops gradually, usually within the first forty-eight to seventy-two hours after the operation. The abdomen of the patient gradually distends; the temperature falls to normal or below normal, or rises to 103° or 104° F. The pulse steadily rises to 110, 120, 130, and in fatal cases still higher. The tongue is dry along the center, often brownish in color, and the mouth and lips are sometimes dry. The patient may complain of no especial pain, is apathetic, listless, without appetite, often thirsty, and very rarely aware of her dangerous condition. In some cases acute abdominal pain is present. The skin may be leaky, a constant and clammy perspiration being present. Chills may be distinctly detected, or the patient may never have a well-pronounced chill. The bowels will not move in spite of injections or medicines, or a profuse and sometimes fetid diarrhea is present.

The treatment of this condition varies in different cases. The physician will purge the patient freely, endeavoring to move the bowels copiously by injections. If vomiting be present, the stomach will be washed out, the patient will be stimulated very freely, the wound will be redressed and carefully examined, and the abdomen may be re-opened. For the reduction of fever, sponging, the use of a large abdominal ice-bag, and cold packs may be

employed. If delirium and restlessness develop, sedative medicines will be given, often by hypodermic injection.

If the patient's stomach can retain food, liquid nourishment will be given in small quantities at frequent intervals. If nothing is retained, an effort will be made to feed and stimulate by the bowel.

If the course of the infection is not rapid, the patient may develop bed-sores, abscesses in the line of incision and abdominal walls, while abscesses in other portions of the body may also form.

The responsibility of the nurse in cases of septic infection after operation rests primarily in detecting the condition promptly and reporting it at once. The physician is responsible for the treatment, in which the nurse can do much by faithfully and intelligently following his orders.

In some septic cases constant rectal irrigation is practised. This is done by inserting a medium-sized catheter into the bowel, to which is attached a fountain-syringe, or other receptacle, for fluid. This is hung just sufficiently high above the patient to cause the fluid to pass very gently, but constantly, into the bowel for absorption. Normal salt solution is usually employed, and this entering by the bowel is absorbed, and makes its way out of the body through a drainage-tube, or gauze drain, placed at the lower end of the abdominal incision. By this means a constant irrigation and drainage of the abdominal lymphatics is secured.

A septic patient usually shows signs of infection in some portion of the skin. Bed-sores form very rapidly in these cases, as the vitality of the tissues throughout the entire body is gradually diminished. Especial care is

necessary to maintain the skin in good condition. In some cases where inflammation of the veins is present, the skin over the veins may become enormously stretched, the superficial layers may die, and the tissue become infected. Sloughing sometimes extends to the subcutaneous tissues, requiring incision and drainage. In all septic patients the nurse should be on the lookout for skin lesions, should report them promptly to the attending physician, and remember to follow faithfully his directions concerning their care. By keeping such lesions cleaned and as aseptic as possible, much comfort will be given to the patient, and her dangers will be considerably lessened.

Septic patients are rarely normal in mental condition. Some become delirious during the fever, while many of the most dangerous and fatal cases show perfect indifference to their surroundings. It is, in fact, always a dangerous symptom when a septic patient asserts that she has no pain or distress, but feels excessively wearied and cannot rouse herself to take interest in anything about her. Many patients who are not fatally ill become greatly depressed and even melancholy. It is the nurse's duty to always encourage these patients in every way in her power, assuring them that all possible will be done for them, and giving them every hope of prompt recovery. Where such patients are actively delirious it may even be necessary to restrain them by bandages.

It is of the utmost importance that septic patients take an abundance of food and stimulants. No one but the nurse can manage this successfully, and great skill is sometimes necessary. The nurse should never ask the patient what she wants to eat, or whether she will take it or not, but as nearly as possible, at regular times, the

nurse should bring the food, prepared, and tell the patient kindly but firmly to take it. If the patient sleeps well, she may go an hour or two over the usual time for food. Stimulants are also needed in these cases, and frequently in large quantities. When stimulants do good, the patient is more quiet, with better pulse and somewhat lower temperature after their administration. If stimulus is assimilated the patient does not become intoxicated, no matter what quantity is taken. The fever is reduced by sponging or packing; the patient is usually refreshed when the temperature drops, and will then take food and stimulants. When the fever is very high patients will often take neither. The nurse must watch her opportunity, first, to reduce a very high temperature by the use of cold, and then to cause the patient to take food and stimulants. Neither food nor stimulants should be left long in the patient's room where she can see them. The sight of these objects frequently causes considerable disgust.

In nursing septic patients it must be remembered that the patient may infect the nurse. Abrasions on the hands are especially dangerous to the nurse, and rubber gloves should be worn in dressing septic patients and in all manipulations about suppurating wounds. In practising irrigation or douching, care must be taken that fluid does not spatter into the nurse's face, and especially into the eyes. Infection of a serious nature may result.

Before taking another case after nursing a septic patient, the nurse must disinfect herself most thoroughly and see that her clothing has been repeatedly sterilized. It is well, if possible, not to take another patient after nursing a septic case until several weeks have been passed as much as possible in the open air.

RESTLESSNESS AND THIRST.

Few patients have abdominal section without suffering more or less from these disagreeable consequences. The temperament of the patient and the condition of the nervous system at the time of the operation are very clearly shown by the patient's behavior afterward. If a patient has been accustomed to indulge freely in stimulants of any sort, if she is naturally nervous, irritable, uncontrolled, freaky, and irresponsible, she will suffer after a serious surgical operation. In some cases the patient's suffering from her disease has made the nervous system so sensitive that she feels shock very keenly. The depressing effects of long-continued pain are strikingly shown in the behavior of these cases after operation. Restlessness and thirst are mentioned together because each is largely controllable by the brain. A person who is accustomed to exaggerate the natural sensations of the body suffers far more from thirst than one who does not.

In controlling these conditions the mental and moral influence of the nurse has great weight. Her constant presence, steady watchfulness, and gentle and tactful restraint will help the patient to control herself in a measure and will lessen greatly her suffering. Cheerfulness and hope aid much in producing this result. In a fit of restlessness the patient may do herself great harm, and hence should not be left alone for one moment night or day during the first three days after an operation. With the permission of the physician, restlessness may be much alleviated by gently kneading the patient's lower limbs, supporting the patient's knees by placing beneath them a large firm roll. Rubbing the knees gently often tends to relieve restlessness.

For the relief of thirst patients are ordered hot water in sips, and by some operators the use of cracked ice is also allowed. The lips and mouth may be gently moistened with cold water or with glycerin and lemon-juice in water. If thirst be severe, from six to eight ounces of boiled water may be injected into the rectum every four hours. In our experience hot water in sips checks thirst much more promptly than any other means.

If restlessness and thirst are augmented by pain, the physician must be notified, when suitable treatment will be ordered. It is often necessary to control such patients for the first few hours after an operation by the hypodermic injection of morphin, and no bad results follow such treatment. In some cases codein proves useful.

ABDOMINAL DISTENTION.

This distressing condition may begin to develop soon after the operation, and steadily increase. It may occasion little suffering or it may give the patient much distress. The physician should be notified, and his treatment will be directed to removing the gas from the bowels and preventing its further formation. He may order the nurse to pass a soft-rubber rectal tube as high into the bowel as possible, allowing it to remain for some time for the escape of gas. An enema of one tablespoonful of spirits of turpentine in one pint of Castile soapsuds may be used, or an enema of asafetida may be employed. In many cases the physician will begin the administration of purgative medicine if distention of the abdomen occurs. Such medicine may be calomel. If no result is obtained by the first injection, it may be repeated in an hour, and again in an hour, when success may follow. A moderate degree of abdominal distention is

not a very dangerous condition, although it is not a welcome symptom to the physician. In obstinate cases the bowels and stomach are freely irrigated, purgatives are given, stimulants are administered by the mouth or hypodermically, and a thorough and persistent effort made to remove the gas from the intestines. If nothing can be accomplished by these means, a fatal result may be feared. The patient may pass gas freely by the mouth, but this seems to have little influence in lessening the distention of the abdomen.

FOOD AND STIMULANTS.

Patients may be fed after operation, and stimulated by the bowel or by the mouth. Some physicians give nothing for the first twenty-four hours, then beginning gradually to feed by the mouth. Others give nutritive and stimulating enemas from the first until the bowels move, and then begin the administration of food by the mouth. For administration by the bowel, peptonized milk, two ounces; white-of-egg water, one ounce; and warm water, two ounces, form a useful nutritive enema. A raw egg beaten up with two ounces of peptonized milk, to which two ounces of water are added, is also useful. One ounce of beef-juice in four ounces of warm water may also be used. As a stimulant, two ounces of whiskey in four ounces of water may be employed. Whiskey, one to two ounces, and salt solution, four to five ounces, make an excellent stimulating enema.

If food be given by the mouth, a teaspoonful of peptonized milk and a teaspoonful of barley-water may be administered every hour or two. If this be retained, the quantity may be gradually increased to one ounce of peptonized milk and one ounce of barley-water given every

two or three hours. If it be thought wise to give stimulants by the mouth, the best quality of whiskey diluted with twice its volume of water is usually best. If good brandy can be obtained, this is well taken by some patients.

Stimulants are often given by hypodermic injection, strychnin and digitalis being the drugs most often used. The nurse should be careful to boil the needles repeatedly, and to have the solution employed perfectly clear. The site of puncture should be prepared by scrubbing with soap and water, and then with alcohol. If the nurse be exceedingly careful and thorough, no suffering will result from hypodermic injections at her hands. When the first food by the mouth has been retained, it is often usual to add to the nourishment freshly made chicken-broth salted and given hot.

THE FIRST MOVEMENT OF THE BOWELS.

Usually within forty-eight hours after the operation, and in all cases we believe within seventy-two hours, the bowels of the patient must be thoroughly emptied. Operators differ much in the way in which this is accomplished. Some invariably give calomel in small doses often repeated, or in several comparatively large doses. It may be combined with sodium bicarbonate or given with sugar of milk. Others prefer a saturated solution of Rochelle salt or Epsom salt, given in teaspoonful doses every hour. After a purgative has been administered by the mouth for a certain length of time an enema is often ordered. Glycerin, one to two ounces; magnesium sulphate, one to two ounces; and Castile soapsuds, one pint, is an efficient preparation. To this may be added a teaspoonful or tablespoonful of spirits of

turpentine. Others prefer the enema of Castile soapsuds, one pint to one quart; castor oil or olive oil, one to two ounces; spirits of turpentine, one tablespoonful beaten up with the yelk of one raw egg, the whole to be thoroughly mixed and administered while warm. In giving enemas after operations it is customary to raise the patient's hips slightly, turning her a very little upon the left side. A folded pillow or blanket is placed beneatn the back, a Kelly pad being put beneath the patient so that the enema may drain into a bucket at the side of the bed. When the condition of the patient is so critical that this slight motion cannot be allowed, old linen or oakum, or cotton-batting, may be placed about the anus and the discharges soaked up in this way. It is rarely, however, that the nurse will not succeed in placing the patient upon some sort of receptacle. If the first injection does not succeed, it is customary to repeat it in one or two hours afterward. In some cases the rectal tube may be inserted and allowed to remain for an hour or two, favoring the escape of gas and fecal matter. As the first thorough movement of the bowels is most important, the nurse must not despair, but by gentle and repeated trials succeed in accomplishing her purpose. If a patient has not been ill previously and has not had injections, the nurse may have to overcome considerable timidity and nervous apprehension on the part of the patient.

THE MURPHY METHOD.

It may be desirable to introduce salt solution in a small quantity constantly into the bowels. For this purpose a good-sized soft catheter is employed, attached by glass tubing to the long tube of a fountain syringe. The bag of the syringe should be not more than four feet above

the patient, and the flow of salt solution through the tube should be so regulated that a very small quantity escapes constantly. The flow may be governed by tying a piece of bandage around the tube or, better, by compressing it with a clip or hemostatic forceps. The salt solution should be at the normal temperature of the bowel, 100° F. The catheter should be thoroughly warmed and well oiled before introduction. If there is fecal matter in the lower bowel, this should first be removed by a copious enema. The catheter may be kept in place by a T-bandage and a pad of gauze placed about the catheter or, sometimes, by adhesive plaster. The physician should give precise directions as to the length of time the fluid should run. Unless the bowel becomes irritated, from four to eight hours is the usual interval. If the patient expels the catheter, an effort should be made later to reinsert it, and if the bowel be thoroughly cleansed the catheter will often be retained. The nurse should keep a note of the length of time this treatment is carried out, the quantity of the fluid used, and whether or not the patient's bowel becomes irritable. This method of treatment requires constant attention to see that the catheter does not become displaced and that the salt solution is given at the proper temperature.

THE FOWLER POSITION.

It is sometimes desirable to raise the patient after operation until she reclines in bed almost in the sitting posture. This is done by adjusting a bed-rest or, if this cannot be obtained, by placing a chair covered with pillows or blankets behind the patient. This posture will often facilitate breathing, and gives better drainage in some septic cases. The nurse should see that the patient

does not become faint, and should an attack of syncope occur the patient must immediately be placed in the horizontal position.

THE USE OF THE CATHETER.

It is customary to catheterize patients within six or eight hours after the operation. Afterward the spontaneous passage of urine is encouraged. A record should be kept as nearly as possible of the number of ounces of urine passed, and a specimen should be set aside for the physician's examination.

INCREASED DIET.

After the bowels have moved freely the diet of the patient is increased in quantity. Chicken-broth, mutton-broth, clam-broth or oyster-broth, buttermilk, peptonized milk prepared by the cold process, white-of-egg water, or wine whey is given in from two to four ounces every three to four hours. Any agreeable form of water may be administered every alternate three or four hours. If there is a tendency to the formation of gas and to slight nausea, the use of hot water is especially beneficial. Some physicians allow a cup of tea or coffee for breakfast, with milk-toast, or a soft egg or junket. The increase in diet must be determined by the conditions of each individual case, and not by rule or routine. The state of the tongue, the condition of the abdomen, the number and character of the bowel movements, the pulse, the temperature, and general vigor, must all be considered in deciding to increase the patient's diet.

STIMULATION BY THE MOUTH.

Stimulation by the mouth is often necessary in cases in which shock or hemorrhage has been present.

Strychnin given with liquid nourishment is commonly used. Alcohol combined with nutritious material or well diluted with water may also be administered. Should septic infection be present, the quantity of alcohol given will be limited only by the patient's power to absorb it. In critical cases stiumulus must be given hypodermically. Strychnin, digitalis, and atropin are the drugs most commonly employed.

CHANGES OF POSTURE.

A patient after abdominal section must remain as quiet as possible for the first few days. If the patient does well, slight changes of posture may be allowed, and are exceedingly grateful to the patient and lessen very much the fatigue and irksomeness of the convalescence. The limbs may be slowly and gently flexed, and if desired may be supported by a large firm roll placed beneath the knees. With permission from the physician, the patient may be very gently turned upon one side. Pillows or a blanket rolled lengthwise should be placed beneath the patient to support the body in the new position. The head may be slightly raised by shifting the pillow, while the pelvis is sometimes raised to promote absorption. This is usually done immediately after the operation, folded blankets or sheets being placed beneath the pelvis, so that the lower portion of the body is considerably higher than the upper. After many operations it is thought of great advantage to raise the patient's shoulders to promote drainage from the abdomen. Patients must not be raised too high, as they will often complain of faintness, giddiness, and sometimes of disturbed vision.

THE CARE OF THE SKIN.

Not only is the patient's comfort greatly promoted during convalescence by attention to the skin, but her recovery is also hastened. In ordinary cases a soap-and-water sponge should be given in the morning, with an alcohol-and-water sponge and light rubbing at night. The nurse must be careful not to disturb the dressing and to move the patient as little as possible in giving these baths. When severe shock and depression are present it is advantageous to act constantly upon the skin, and the patient may be placed between blankets for this purpose. Should septic infection be present, the patient may be frequently sponged to reduce temperature or to stimulate the blood-vessels. In prolonged cases, in which the patient's nutrition is greatly reduced, bed-sores may develop. To prevent this complication, bathing the affected part with alcohol, protecting the tissues from pressure upon a threatening point, placing the patient upon a blanket instead of upon a sheet, the use of astringent lotions and powders, may all be tried. Unless the patient's position can be so changed that pressure is removed, the danger of bed-sores in debilitated persons is very considerable. The use of a water- or air-bed may be necessary in some of these cases.

THE CARE OF THE DRAINAGE-TUBE.

In some cases a drainage-tube may be left in the lower end of the abdominal incision for removal several days after the operation. Its care and its removal are usually the work of the operator or his assistant. In some cases nurses are asked to pump out the drainage-tube at

frequent intervals for the first twenty-four or thirty-six hours after the operation. In these patients a glass tube

Fig. 90.—Glass drainage-tube (Ashton).

is employed, which is surrounded upon the abdominal surface by sheet rubber. Over the mouth of the tube is placed aseptic gauze, and the rubber is folded together over the gauze. Thus the remainder of the abdominal incision is protected from contamination with the discharges from the tube. To empty such a tube the nurse requires a piston-syringe, holding several ounces, with a long nozzle or having attached to it a piece of sterile rubber drainage-tubing. Having made the syringe and tubing and her hands aseptic, the nurse unfolds the sheet rubber, removes the saturated gauze, introduces the tubing and syringe into the glass tube, and, slipping it gently down to near the bottom of the tube, withdraws the piston of the syringe. The syringe is then withdrawn and its contents expelled into a cup or bottle, and retained for the physician's examination. When no more fluid follows the use of the syringe the internal surface of the sheet rubber is thoroughly cleansed with sterile water or with an antiseptic solution, a fresh mass of antiseptic or aseptic gauze is placed over the tube, the rubber is brought together, and the abdominal bandage is replaced. When gauze drainage is employed the nurse may be instructed to renew the gauze placed upon the surface of the abdomen, but on no account must she make traction upon the gauze packing within the abdomen. Strict cleanliness with antiseptic precautions must be exercised in this manipulation.

WHEN IS A PATIENT CONVALESCENT AFTER ABDOMINAL SECTION?

When the bowels have moved freely, the abdomen is soft, painless, and not distended, the temperature not above 100° F., the pulse not above 100, the kidneys act freely, the tongue is moist and clean, and the patient is hungry and sleeps without medicine, she is considered convalescent. She must still receive exact and faithful care before the first dangers following the operation have been passed.

THE NURSE.

A nurse who cares for a case of abdominal section should be relieved sufficiently often to enable her to procure needed sleep. If possible, two nurses should divide the care of such a patient. It must be her effort to surround the patient with a gentle, steady, and hopeful influence which is of the greatest service. In dealing with such patients the nurse will learn to pay little attention to minor complaints, and to divert the attention of the patient if possible from them. She must not forget to keep herself well nourished during the strain to which she is subjected. Many nurses when losing sleep do not enjoy considerable quantities of solid food. They must then feed themselves with liquid food at shorter intervals. A nurse can usually obtain milk, cocoa, and very often broths and soups. Such food, with bread and butter and fruit, serves admirably in these emergencies. As soon as possible the nurse should be relieved for some portion of the time during the day. The early afternoon is a convenient time, when the nurse may bathe, and obtain sleep and fresh air. If two nurses are employed, they should

so divide the time that each obtains abundant rest. If the physician comes at a regular time to pay his visit, both nurses should endeavor to be present. The following information should be given in the record kept by the nurse: The pulse, the temperature, and the respiratory rate; the occurrence of vomiting or retching; the number of hours of sleep which the patient obtains; the quantity of urine obtained by catheter or passed spontaneously, a specimen being saved for examination; the passage of gas from the bowel or from the mouth, and the occurrence of a bowel movement; the presence of abdominal distention or abdominal pain; the administration of medicine; enemas given and changes of posture made; medicines given by hypodermic injection and sponge baths administered; the occurrence of sweating or a dry condition of the skin; the presence of delirium, syncope, or coma. There should also be noted accurately the quantity of food or fluid taken by the mouth, by the bowel, by transfusion, or by hypodermoclysis.

CHAPTER X.

CONVALESCENCE AND RECOVERY.

At the conclusion of the operation it is customary to place upon the abdomen a dressing composed of aseptic or antiseptic cotton enclosed in aseptic or antiseptic gauze; wood-wool or jute is sometimes used instead of cotton. Such a dressing is retained in position by strips of adhesive plaster, which are applied to the sides of the body, passing across the dressing and holding it firmly in position. Some surgeons prefer to use adhesive strips which do not cover the dressing, but which are applied at the sides of the body and terminate with stout tapes, which are sewed upon the ends of the adhesive strips. These tapes are tied across the dressing, thus retaining it in position. A many-tailed bandage of flannel is usually applied over the strips, and is made by taking a piece of flannel wide enough to extend from the buttocks to the ribs and nicking it with scissors at points three inches apart. This is placed beneath the patient, and the flannel is torn in strips at the points nicked, which are then passed firmly across the abdomen, overlapping and pinned with safety-pins. In some cases drainage is inserted, and the dressing is varied in accordance with the needs of such a case. Should the dressing become stained by discharges from the abdomen, the nurse should notify the physician at once. Should the dressing become displaced he must also be informed. Should distention of the abdomen become so extreme as to cause great suffer-

ing through the pressure of the dressing, the physician must be summoned.

RE-DRESSING.

In cases in which the dressing does not become soiled, and the patient does well, it is sometimes allowed to remain for ten days or two weeks. Other operators prefer to change the dressing within the first three days after operation. The staining of the dressing by the discharge is an indication for renewing it. The nurse should prepare for this a fresh dressing of cotton and gauze, fresh adhesive plaster with or without tapes as desired, and a new and clean flannel bandage. Sterile towels will also be needed, with sterile water, mercuric chlorid, and gauze sponges. The soiled dressing may be dropped into a basin or upon a large newspaper, in which it can be folded and burned. The physician's hands must be made aseptic, and also those of the nurse. The patient is prepared for the change of dressing by having the limbs well flexed and a support placed beneath the knees. The dressing is exposed and the clothing and bedding about the abdomen are covered with clean or sterile towels. Materials needed are placed conveniently for the physician. The bandage is then opened, the soiled dressing removed, and if there has been no discharge a fresh dressing is applied. Some physicians powder the abdominal incision with iodoform and boric acid. If discharge is present, the physician will cleanse the surface of the abdomen with the gauze sponges and sterile water or antiseptic solution. Unless the adhesive strips have become much soiled, it is not necessary to remove them if the dressing is done soon after the operation. While the dressing is being changed, if the

nurse finds the skin in the vicinity of the dressing blood-stained or soiled, she should take the opportunity to cleanse it. If there are points of redness or soreness, the application of alcohol will prove useful. When the first dressing has been applied the patient must be lifted gently a short distance from the bed, the old flannel bandage removed and the new one inserted. The strips are then applied and the bandage is fastened, beginning from above and going downward. In this way steady and firm pressure is made upon the abdomen. In hospitals, dressing-stands are very useful for ward-work in these cases. Such can be wheeled to the bedside containing the materials needed for the renewal of the dressing. In private houses such conveniences are lacking.

THE REMOVAL OF THE STITCHES.

Many operators remove all or the greater portion of the stitches at about the tenth day after operation. Some prefer to leave them longer. Some remove a portion of the stitches as early as the seventh or eighth day, leaving the remainder until the tenth. The nurse should prepare for this dressings and solutions, as already described for changing the dressing. The physician will bring scissors, forceps, and any other instrument required, and these the nurse should sterilize by boiling. They should be placed in a basin or pan of sterile water or antiseptic solution. It is best for the patient not to know the exact number of stitches, nor to look at them while being removed. Thus the ordeal will be less than she imagines. If the patient asks if the removal of stitches will hurt, the nurse should say that it will, but that the pain will not be great, and that the patient will be more comfortable afterward. It is never wise to deceive a

patient no matter what that patient's condition may be, and this is certainly a case in which there is no excuse for even a small deception. The nurse should save the stitches for the physician's examination, unless she is sure that he does not care to examine them.

STITCH-HOLE ABSCESS.

As it is almost impossible thoroughly to disinfect the skin, it is not surprising to find abscess occasionally occurring along the tract of sutures. If promptly treated, this is rarely a dangerous complication. Its presence may be inferred when the patient has a temperature of 101° or 102° F., and complains that the stitches are painful or irritable. The physician will then change the dressing, removing the stitches when suppuration is present and washing out the suppurating tract with sterile water or an antiseptic. Hydrogen peroxid is very commonly used for this purpose. A small glass piston-syringe is employed, and the antiseptic injected to the bottom of the suppurating tract. Such treatment should be given daily until suppuration entirely ceases. Stitch-hole abscess may not be the fault of the operator or nurse. A patient will occasionally pass her fingers or some object beneath the binder to rub or scratch the stitches, and thus infect them. In a case under the writer's observation a young girl infected the stitches after a Cesarean operation by passing a hairpin beneath the dressing. She was unwilling to leave the hospital because outside the hospital she was obliged to work.

When stitch-hole abscess occurs and a discharge persists a suture or ligature may be infected. In some cases this will loosen and make its way toward the surface of the body. In other cases it may be removed by

making traction upon it with small forceps. In some cases the patient must be anesthetized, the sinus dilated, and the stitch removed. Nurses should preserve and show the physician any knots or bits of suture which may stick to the dressing or come out with the discharges.

CHANGES IN DIET.

As the patient advances in her recovery she naturally craves solid food. Soft eggs, sweetbread, junket, milk-toast, and white meat of chicken and oyster livers are the articles of food usually first allowed. Later she may take what is known as the light diet of hospital dietaries, being careful to avoid all indigestible and heavy articles or those which might cause irritation of the intestine. Patience and self-denial in the matter of diet will bring to the patient an ample reward. Occasionally indiscretion in diet has brought about a fatal complication.

SITTING UP.

The first sitting up which the patient does should be the gradual raising of the shoulders in bed to take food. A head-rest may be used for this purpose. Then under the physician's orders the patient may be transferred to a couch, and very gradually allowed to put the feet upon the floor, and finally to bear her weight upon them. It is usually very grateful to the patient to be allowed to sit up long enough to use a commode. Here again self-denial brings abundant reward in the end, as the patient by getting up too soon may bring about a hernia of the abdominal wall, from which she may be very slow in recovering. Much depends upon the vigor of the patient and the absence of complications as regards her sitting up. Some patients are not out of bed or with the feet

upon the floor for four weeks after the operation. Others are allowed to get up in three weeks, and each case must be governed by the individual conditions.

VENTRAL HERNIA.

The abdominal wall is composed of several layers, each of different tissue. These are all severed by the physician in operating; and if the abdominal wall is to be again as firm and elastic as it was before, these layers must be healed together in essentially their original arrangement. When this does not occur, as the patient gets up and pressure is brought to bear upon the scar the tissues gradually separate, leaving only one or two layers held together. These are not sufficient to hold back the intestine and omentum, and a protrusion occurs formed by the layer covering the intestine and the omentum or intestine within. This is termed a "ventral hernia," and is an annoying complication in the patient's recovery. It is detected by observing a protrusion with a gradual thinning and widening at some point in the abdominal scar. It is usually treated by having a pad fitted to an abdominal belt in such a position that when the belt is applied the pad will make firm pressure over the greater part of the entire incision. If the pad is too small, it will enter the weakened point and dilate the tissues still further, making the hernia larger. Where this condition comes on some time after the operation the patient must be fitted with a silk and rubber or silk or flannel band adapted especially to the purpose. Such are usually furnished by those who manufacture deformity and orthopedic apparatus.

The operator will caution each patient to wear a supporting bandage for a short time after the operation. In

some cases this bandage is worn from six months to a year; in others but two or three months. Such bandages are annoying, because they sometimes chafe and irritate the skin, and they have a constant tendency to slip above the place where they are needed. This is overcome by attaching perineal straps to them, which pass over the perineum and are attached to the anterior and posterior edges of the bandage. These straps give considerable discomfort, however, and may become soiled and very irritating. While the patient is wearing such a bandage she must take especial care of the skin beneath it. Bathing with alcohol and water, or with a solution of alum (a teaspoonful to the pint), the use of a simple toilet powder, or of powdered boric acid or powdered zinc oxid, beneath the bandage may be useful and tend to lessen its irritation. The patient, however, will be but too glad to get rid of all forms of supporting and retentive apparatus.

SUDDEN DEATH DURING RECOVERY FROM ABDOMINAL OPERATION.

It occasionally happens that upon assuming the sitting or erect posture, and sometimes without apparent cause, the patient suddenly grows faint and dies. Death comes so quickly that little or nothing can be done to prevent it. Hypodermic injections of ether given over the heart, or of ammonia, the inhalation of stimulating vapor, such as that of camphor or alcohol, or amyl nitrite, an effort to introduce stimulants into the circulation, placing the patient with the head low, are all measures that may be used, but generally without the slightest effect. Before the nurse can realize the gravity of the situation the patient is dead. The cause of this destruction of life is

found in a clot which originally formed in the tissue about the seat of operation, and which became loosened and has been carried in the blood to the heart or brain. A nurse should never describe so dreadful an accident to a patient. But the knowledge that such may occur should make the nurse careful in allowing the patient to exert herself during her convalescence.

CHAPTER XI.

VAGINAL CELIOTOMY.

By vaginal celiotomy we understand the opening of the peritoneal cavity from below, through the vagina. In a number of cases this is an excellent method for removing small tumors and for treating inflammatory conditions of the pelvic organs. In this operation the vagina is opened behind the womb, an examination made, and then further opening of the vagina is practised until the diseased tissues can be brought down and removed in part or entirely.

Preparations for Vaginal Celiotomy.—The preparations for this operation are the same as those described in treating of abdominal celiotomy. Especial attention must be given to cleansing the pubic region, the vulva, the rectum, and the vagina. It is usual to scrub the mucous membrane of the vagina with green soap and water, douching it copiously with sterile hot water, then with mercuric chlorid (1 : 2000) or with lysol (1 per cent.). Especial care is exercised in catheterizing the patient and in preparing the rectum before the operation.

Posture.—The patient is placed in the dorsal position, and the limbs raised, flexed, and supported by stirrups or held by assistants. It must be remembered that in any case requiring vaginal celiotomy it may become necessary during the operation to place the patient in the Trendelenburg posture and open the abdomen. Ac-

cordingly, the patient and the table must be prepared for abdominal section and the Trendelenburg posture.

Instruments and Appliances.—In addition to the instruments usually employed for abdominal section, retractors or specula especially designed for vaginal operations are often used. Sutures, ligatures, and needles are prepared as usual; aseptic gauze in strips four inches wide and a yard long must be in readiness, while many operators prefer iodoform gauze (10 per cent.) of the same size. There should be prepared a large vulvar dressing composed of bichlorid gauze and sterile or antiseptic cotton made into a suitable pad, to be held in place by a T-bandage.

Hemorrhage and Shock.—In many of these operations shock is less than in abdominal section. In some, hemorrhage is more apt to occur, and the nurse should be careful to watch the patient for this complication, noting the pulse and general condition, and also examining the vulvar dressings to detect staining with blood. In some of these cases hemostatic forceps wrapped with gauze are left within the vagina for some time. If they should become separated, serious bleeding may result.

After-treatment.—It is often necessary to catheterize these patients for a considerable time after the operation. The bowels are moved more easily as a rule than after abdominal section, and in the same manner. The nurse must be especially careful to cleanse the external parts thoroughly with sterile water, then with bichlorid solution (1 : 2000), and apply antiseptic dressings after each emptying of the bowel and bladder. The same precautions observed after a case of labor must be carried out in these patients.

Dressings.—The physician will usually remove in-

struments left within the vagina and the first gauze dressing within a few days after the operation. In some cases a very gentle irrigation of the vagina with normal salt solution is practised. In others the cavity is cleansed with gauze sponges dipped in sterile water and the gauze packing is removed. Later in the convalescence, should a discharge persist, antiseptic or aseptic douches may be ordered.

Convalescence.—In selected cases patients recover more easily and rapidly than after abdominal incision. In other cases considerable discharge of an unpleasant odor persists for some time. While the patient avoids the danger of ventral hernia which is present after abdominal incision, yet the persistent discharge and odor are sometimes very annoying. After these operations the shoulders and head of the patient should be gradually raised in bed to promote free drainage.

CHAPTER XII.

CANCER.

MALIGNANT disease often attacks the pelvic organs or the breasts of women. Its high rate of mortality, the fact that only operations of considerable severity can influence the disease, and the pain and distressing symptoms which accompany it make it a terror to patients. For this reason friends and relatives often endeavor to keep the patient in ignorance of the true nature of her malady. The nurse must frequently coöperate with them in the attempt.

Suspicious Symptoms.—While there can be no objection to sparing the patient the distress and alarm which the knowledge that she has cancer may occasion, still the results obtained by early operation are such that suspicious symptoms should lead the patient at once to consult a physician and to submit promptly to treatment. In mammary cancer the presence of a lump near the nipple, the drawing in of the nipple, and vague shooting pains through the breast are sufficient to require thorough examination and treatment.

CANCER OF THE PELVIC ORGANS.

In cancer of the pelvic organs the occurrence of irregular hemorrhage, no matter at what period of life, demands the most thorough and painstaking examination. Cancer is sometimes overlooked if occurring at the menopause, because the patient believes that irregular hemor-

rhage is due to the cessation of menstruation, and not to a foreign growth. Especial caution should be observed at this time that the patient may be sure that no serious disorder is present. If the patient has a discharge of blood, dark, thin, and grumous, offensive in odor, and mingled with small particles of grayish or yellow substance, this discharge is still more indicative of a possible cancer. If the patient describes to a nurse the occurrence of irregular hemorrhage with or without offensive discharge, the nurse should urge her by all means to seek competent medical aid at once. In such a case there may be present some condition which can be completely cured without a serious operation. With other patients, so soon as the diagnosis of cancer is made the uterus must be removed, or the mammary gland.

Operative Treatment of Cancer of the Pelvic and Abdominal Organs.—There is but one treatment for this condition, and that is thorough removal by surgical means. Numberless other remedies in the way of medicines, salves, plasters, douches, cauterizing, and electricity have been tried with uniform failure. Operation is undertaken in these cases through the vagina or through the abdominal wall, and in many instances both the abdominal wall and the vagina are opened.

The preparation for this operation and the care of the patient afterward are those already described. In some cases, in addition to the removal of the growth by cutting instruments, the cautery is extensively employed. It may be necessary for the nurse to assist in keeping the cautery hot, and she should exercise caution not to burn the patient's body or herself with the instrument. Cancer of the womb, if subjected to early operation, is sometimes delayed indefinitely and occasionally cured. Patients often make a speedy recovery from the operation, and

live in comparative comfort for an indefinite time. Cancer of the abdominal organs offers a less favorable prospect, but may sometimes be greatly delayed by early operation.

CANCER OF THE BREAST.

No treatment but that by operation offers any prospect of success in these cases. Careful surgeons are not content with removing simply the affected breast, but carry the incision into the axilla, removing lymphatic glands connected with the breast and any other affected tissue. The operation is an extensive one, but in good hands has a low rate of mortality.

Preparation of Patient.—The patient is prepared for this operation by purgation, rest in bed, bathing, and attention to the condition of the bronchial tubes and kidneys. The axilla on the affected side should be shaved, and the skin over the breasts to the axilla thoroughly scrubbed with green soap and water, then with alcohol, and then with mercuric chlorid (1 : 1000). A copious dressing of bichlorid gauze should be placed over the part, filling the axilla completely. At the time of operation it is well to put upon the patient a sterile linen jacket which will cover completely the anterior surface of the body and both arms. This may be made of unbleached muslin or other cheap material, and at the time of operation the surgeon or nurse may cut away enough to expose the parts to be operated upon, leaving the body covered with the remainder. The forearm on the affected side should be bandaged with sterile gauze, as it will be grasped by an assistant to hold the parts in position for the operator.

Preparation of Apparatus.—These operations usu-

ally require the dorsal position, with limbs extended, although the table should be so arranged that the patient's head can be lowered if desired. The patient is placed at the side of the table, the arm on the affected side bandaged on a rest or held by an assistant. As many vessels may require ligature, the nurse must see to it that an abundance of medium-sized catgut ligatures and also an abundant supply of hemostatic forceps are in readiness. The operator should select his instruments, and should tell the nurse whether he intends to use drainage by tubing, by horsehair, by gauze, or by strands of silkworm-gut, or any other method. The solutions usually employed at major operations should be at hand, with appliances for transfusion and resuscitation. Hypodermic syringes should also be in readiness with other appliances for operation.

The Dressing.—The dressing for such a case is a large one, covering the axilla and the side of the chest on which the operation occurs. It is retained in place by a broad gauze or flannel bandage applied across the body and over the shoulders in a figure of 8, or it may be kept in place by a bandage resembling the breast bandage used after confinement. Gauze and cotton are usually employed for the dressing. Wood-wool and jute are sometimes used.

After-treatment.—The patient will need restraint until fully recovered from the ether, after which she is usually comparatively quiet. If pain be distressing, the nurse must summon the physician or give such medicines as he may have ordered. She must watch the dressing for signs of oozing, and note the patient's pulse and general condition to determine the existence of hemorrhage. Many surgeons renew the dressing at the end

of thirty-six or forty-eight hours, and do not dress the wound again until the stitches are removed. If drainage has been employed, the means of drainage is usually removed at the first dressing. The patient's diet is at first liquid, and then increased so soon as the bowels have moved, and she is soon put upon light diet. Her general care consists in attention to the bowels and skin, thorough neatness about her bed and bedding, and attention to her nourishment and sleep. The arm may be supported in a sling if the operation is not extensive, and a large bandage is not required. Such patients are usually convalescent in ten days after the operation, or occasionally before. As the patient is usually aseptic, there should be very little variation of temperature after the operation, and the patient should make a speedy recovery.

NON-OPERATIVE TREATMENT OF CANCER.

Unfortunately, many patients delay interference until it is hopeless or do not have a correct diagnosis of the case made in time for operation. In these cases the condition is a very distressing one. Ulceration of the tissue is occurring, the patient is annoyed by foul discharges, emaciation and weakness are present, pain may be constant, and the patient realizes that she is in the grasp of a fatal malady. While the physician may prescribe soothing drugs and comfort by his sympathy, he sees the patient but a short time at each visit, and her care devolves upon her nurse and friends.

Keeping the Patient Clean.—The greatest service which the nurse can render is to keep the patient clean, neutralizing the foul odor of offensive discharges. When the discharge comes through the vagina, douching with

or without the application of antiseptic powder or antiseptic gauze is necessary. While nothing will destroy completely the foul odor of advanced cancer, still much can be done to mitigate this distress. Douches of potassium permanganate (the solution being of a mahogany color), of creolin (1 or 2 per cent.), of mercuric chlorid (1 : 2000), and of pyoktanin (1 : 500) have all been used. Antiseptic powders may be thrown into the vagina, such as iodoform, iodol, or its derivatives, boric acid, or alum. Where bleeding occurs it may be necessary to pack the vagina with iodoform gauze. A large vulvar dressing of bichlorid or sterile gauze, containing oakum or jute or cotton- or wood-wool, must also be used. If irritation and chafing result from the dressing, carbolized ointments may be employed to advantage. These dressings must be changed as often as necessary and burned. The parts must be thoroughly cleansed externally at each changing of the dressing. Glass douche-tubes should be employed, and should be kept in an antiseptic solution. It is well for the nurse to protect her hands with rubber gloves before dressing or douching cases of cancer.

CANCER OF THE BLADDER OR BOWEL.

When cancer attacks the bladder or bowel it may be possible to give the patients a chance for life by operation. In cancer of the bowel the cancerous portion may be removed, the healthy part being sewn together, and thus the canal of the bowel re-established. In some cases where cancer is in the lower part of the bowel, the abdomen is opened, the bowel severed, and the healthy extremity brought up to the surface of the abdomen and stitched into the lower end of the incision. This makes an artificial anus through which fecal matter

is discharged. The patient is thus relieved from the pain and distress caused by the passage of feces through the cancerous lower bowel. These patients require careful nursing, as dressings must be constantly worn to receive the fecal matter which oozes from the opening, and these dressings must be frequently changed, before they become offensive. The skin around the opening of the bowel must be kept scrupulously clean, frequently bathed with antiseptic solutions, and the skin sometimes powdered with boracic acid or baked starch.

Cancer of the bowel is among the most distressing of diseases, frequently causing great pain. Patients have foul discharges from the intestine in these cases which make it difficult to keep them neat and clean. Their constant complaint of pain is often relieved by the formation of the artificial anus and by the use of opium.

In cancer of the bladder it may be necessary to open the bladder above the pubic bone or from below, in order to establish a constant drainage. The bladder is often frequently douched with antiseptic solutions, and this is entrusted to the nurse. The urine often decomposes and becomes very offensive. Specimens of urine are often collected for examination.

In these distressing cases it may be necessary to use the vesical catheter or rectal tube for emptying the bowel. The bladder may be douched, or it may be necessary to wash out the intestine. Sooner or later in the case come involuntary discharges from these organs, which add to the patient's distress. The nurse must be especially careful to keep catheters and tubes thoroughly clean and aseptic. Where copious discharges occur, oakum covered with several layers of gauze makes excellent absorbent material. It should be used abundantly and burned promptly when soiled.

BED-SORES.

Patients dying of cancer are especially liable to the formation of bed-sores. This sometimes arises where the discharges from the vagina or bowel are not properly absorbed, but soil the patient's back and are retained upon the skin. The patient must not lie upon a bed which is soft and yielding, and which does not permit the free drainage of discharges. Inflated rubber rings or rings made of bandaged oakum may be used to relieve pressure. Strict cleanliness and the faithful observance of all means to preserve the skin must be practised in these cases.

PAIN.

When active treatment is found hopeless and the disease is progressing steadily, pain is usually a prominent and distressing symptom. This is often worse at night, and does not permit the patient to sleep. There is no drug which takes the place of opium in these conditions. Morphin, codein, or heroin is usually employed. In some cases deodorized tincture of opium by the mouth and occasionally opium by rectal suppository are administered. If hypodermic medication is practised, the nurse must be very careful about the care of the syringe and the solutions employed, and with the patient's skin. The site of the injection should be antisepticized by soap and water, alcohol, and bichlorid solution. Water which has been thoroughly boiled should be employed to dissolve the morphin. The hypodermic syringe should be frequently boiled; or if it is not so made as to permit this, the needle should be boiled in soda and water, and the barrel of the syringe rinsed in alcohol and hot boiled water. The nurse's hands should be thoroughly clean

when hypodermic injections are given. If care be exercised, the patient should not have added to her other misery that of abscess following injection. In some cases it is possible to remove with the cautery painful tissue, thus temporarily relieving the patient. While this relief is but slight, patients often desire and request it.

With many patients pain is much lessened by the free use of alcohol. In view of the distressing nature of the disease and its hopelessness, it is certainly more merciful to allow the patient to use opium and alcohol freely than to withhold them because in other cases they do harm. The best quality of whiskey is chosen for this purpose, and will usually agree best and longest with the patient.

DEATH FROM CANCER.

Death comes to these patients by the development of cancer of the internal organs, or by gradual failure of strength and blood-poisoning from absorption of the necrotic tissue of the cancer. All that can be done is to keep the patient free from pain and as clean as possible. Death usually occurs with symptoms of exhaustion, coma, and heart-failure. Physicians and friends usually feel that it is not right to prolong the suffering of such patients by the administration of powerful stimulants to maintain life.

DANGERS OF INFECTION.

The nurse must remember that cases of cancer are in a high degree septic. She must accordingly protect herself from septic infection, and take measures to disinfect thoroughly articles used about the patient and her room. Clothing that has been worn by a cancer patient should be burned. The same is true of bedding, of matting or carpets in the room, and of utensils used about her. The

room and its contents should be thoroughly fumigated with formaldehyd. If the bed be of iron, it should be scrubbed with green soap and water, with hot water, and then with an antiseptic solution. Paper should be removed from the walls and the room repapered or painted. No case of confinement should occur in a room occupied by a cancer patient for some time after the case of cancer has been ended. No surgical operation should be undertaken in this apartment.

Dangers to the Nurse.—The nurse should take especial precaution that her hands are free from wounded surfaces while caring for a cancer case. Rubber gloves should be employed while dressing the patient and handling soiled dressings. We have no practical proof that the nurse may become infected by cancer through caring for such a case. Before the nurse takes another case she should disinfect her body as thoroughly as possible, washing the hair thoroughly; and should change her clothing completely, using clothing which has not been worn with the cancer case. If she can afford to do so, she should destroy the dresses and aprons which she has worn at the case. If she cannot afford this, they should be repeatedly boiled before being used again. Nurses who have taken care of cancer cases should not take obstetric or surgical cases for several months afterward. They should acquaint the physician in charge with the fact, and tell him what precautions they have taken to make themselves aseptic. He will then share with them the responsibility of the case, and should complications be unjustly blamed upon the nurse the physician can protect her.

CHAPTER XIII.

MENTAL DISEASES COMPLICATING PELVIC DISORDERS.

It is not infrequent to find among women suffering from pelvic disease a considerable number of mental disorders as well. Of these, the most frequent is melancholia.

MELANCHOLIA.

These patients are depressed and unhappy, imagining that they have lost the affection of those about them, and are the victims of groundless fears, suspicions, and misapprehensions. They take little or no interest in things about them, are indifferent in their nutrition, and very difficult to affect by any form of treatment. The tendency to suicide develops among them, and requires the closest attention on the part of the nurse or attendant. Such patients are sometimes very favorably influenced by operative treatment. The anesthesia makes a total break in the monotony of their feelings, while the operation interrupts for the time being the chain of morbid symptoms from which they have suffered. In such a patient the nurse should take care always to present a hopeful view of the situation, while she must be on her guard for any tendency toward suicide.

PERVERSIONS.

In some cases of pelvic disease the patient's natural modesty of feeling is greatly altered or entirely lost. At

the menstrual period the patient grows much worse in behavior, is greatly excited, and requires close attention. Many of these cases are improved by operative treatment, while others are hopeless. The nurse in charge of such a patient must keep her thoroughly and surgically clean, thus removing as far as possible sources of irritation to the pelvic organs. Constipation must be avoided, bathing, exercise, and outdoor life encouraged, and the patient's nutrition promoted in every possible way.

MANIA.

Disease of the pelvic organs does not cause active insanity, but may be present in insane patients and increase their excitability and suffering. If a nurse is placed in charge of one of these patients for operation, she must remember never to trust the patient alone. It is sometimes necessary to restrain such patients, tying them in bed to prevent them from undoing the results obtained from operation while the wound is healing. They should be kept as quiet as their condition permits, and often make good recoveries from operations. In some cases it is difficult to dress them, and they sometimes disturb the dressing. This requires close watchfulness on the part of the nurse, the use of anodynes, and very carefully applied and very firmly bandaged dressings.

GENERAL CARE.

In cases of mental disease complicated by disorders of the pelvic organs the nurse should decline to express an opinion regarding the probability of cure by operative treatment. This question is so difficult to decide that she should not take the responsibility. She should urge, however, that all patients be subjected to a thor-

ough examination by a competent physician, and that this examination should take place while the patient is under the influence of an anesthetic.

THE MENOPAUSE.

The cessation of menstruation is often accompanied or followed by considerable disturbance in the functions of the nervous system. Flashes of heat or cold, giddiness, ringing in the ears, eruptions upon the skin, excessive sweating, flushing of the face, derangements of the bladder and rectum, may all be present. When the menopause is brought about artificially by the removal of the ovaries the same symptoms occur, often with greater violence and with a peculiar effect upon the mind. Some patients are greatly relieved and improved in health by the artificial cessation of menstruation. Their strength increases, appetite improves, they are comparatively free from pain and distress, and take a new interest in life. Others, however—and this is the larger class—feel that they are different from other women and brood over the disease which has made this necessary, becoming melancholy or very eccentric.

The nursing of such a case requires great patience and tact, with the steady application of those means which tend to reëstablish the circulation and relieve the patient's distress. Massage, baths, outdoor life, gentle exercise, are all most valuable. The bowels must move daily and properly, and the skin must receive attention. The patient should take an abundance of gentle exercise in the open air ; and if this is not possible the muscles must be moved by the electric current, this treatment being combined with massage. So far as the mental treatment of the condition goes, the effort must be made to interest

the patient in other things than herself and her symptoms. Too much attention must not be paid to the various sensations which she describes. The cheerful and hopeful view must be taken of the situation, and the patient encouraged to believe that she will before long be relieved of her distressing symptoms.

CHAPTER XIV.

VENEREAL OR SPECIFIC DISEASE.

NURSES must not be surprised to find cases of venereal or specific disease in any class of patients. In many of these cases the patient is entirely innocent so far as the acquiring of the disease is concerned. She is also ignorant of the nature of her malady, and has not taken alarm early, but very probably has allowed the disease to progress until it has become fully established.

GONORRHEA.

The symptoms of this disorder are a yellowish or grayish discharge from the urethra and vagina, burning and smarting pain on urination, with redness and swelling about the entrance to the vagina. The discharge is often irritating, and an eruption upon the skin may occur about the vulva and anus. If the disease is not checked and the patient does not take rest, pain in the lower portion of the abdomen shows that inflammation is spreading throughout the pelvis. Ultimately inflammation of the peritoneum with or without the formation of abscess may result.

The Effects of Gonorrhea.—Gonorrhea resembles a slow fire creeping through underbrush. While comparatively not severe at first, the infective germ travels steadily through the various channels of the pelvis, until the lining membrane of the womb and of the Fallopian tubes and the peritoneal covering of these organs, with

the connective tissue of the pelvis, become involved. The lining membrane of the bladder may also be infected, and the infection may travel up the ureters and abscess form in the kidneys. If the eyes become infected from the discharge, severe inflammation and blindness may result. Should the infection enter the general circulation blood-poisoning and death may follow. Sterility is not an uncommon result of gonorrhea, while inflammation and adhesions of the tubes and uterus are very common.

The Conveyance of Gonorrhea.—The gonorrheal discharge is distinctly contagious and infectious. Hence children may acquire the disease from sleeping with an adult who has such a discharge, or by the use of towels or bedding stained with it. Dirty catheters, douche-tubes, syringes, or other appliances may convey the infection. The hands and fingers frequently carry it.

Treatment.—The nurse must remember that each case of gonorrhea is a thoroughly septic case. Strict antiseptic precautions in the use of solutions and dressings must be observed. The treatment usually consists of vaginal douches of antiseptics, with the application of iodoform or other antiseptic substances to the tissues about the entrance to the vagina. The physician may make applications to the vagina or neck of the womb with instruments. The discharge must be received upon antiseptic gauze or other suitable dressing, and these dressings should be burned as soon as soiled. The patient's bedding and all appliances used about her must be considered septic, and disinfected accordingly. The medicinal treatment of this disorder consists in limiting the diet, giving the patient very freely water to drink, and moving the bowels very thoroughly. Confinement to bed is practised during the active stage of the first

inflammation, with the use of the ice-bag over the abdomen and thorough disinfection of the vagina to prevent abdominal inflammation. When such a patient is up and about she may be annoyed by a whitish or grayish-white discharge, which is also infectious. She should wear a dressing and take strict precautions until she is absolutely without discharge of any sort.

Care of the Nurse.—The nurse who treats a case of gonorrhea should use rubber gloves in giving douches and making dressings, and must be especially careful to keep her hands away from her face and eyes. The hands should be thoroughly cleansed and disinfected before the face is washed, and the eyes must not be rubbed with the fingers. Carelessness may result in infection of the eyes, followed by blindness. The nurse must consider herself septic with regard to cases of confinement or surgical operations. She should take neither without disinfection of her body and clothing, and with full knowledge and consent of the physician in charge.

SYPHILIS.

Acute syphilis is characterized by a sore or ulcer upon the vagina or cervix; by a rose-red or dark-red eruption, becoming copper-colored; by a sore throat with patches of swelling and redness upon the mucous membrane; by headache and loss of hair; and by the development of disease of the bones, liver, and nervous system. It may be transmitted to offspring, and syphilitic children are ill-nourished, pale in color, often deformed, and of feeble vitality.

Treatment.—The physician will usually make applications to a syphilitic ulcer to destroy the poison in the part. The nurse may be required to give vaginal

douches, to use antiseptic dressings, and keep the patient clean. Medical treatment is used extensively in syphilis, and mercury and potassium iodid are given in large doses. Where extensive ulceration is present the ulcers must be dressed with antiseptics and protected by suitable dressings and bandages. All soiled dressings must be carefully burned, and the patient treated as a surgically septic case. The nurse must be cautioned that the disease may be conveyed by the discharges in the acute stage, and that a raw or wounded surface upon the fingers is the most usual place of inoculation. Syphilitic patients should not use the same cups, glasses, or table articles used by others. If the patient has syphilitic sores in the mouth, there is danger of contamination in this way. The nurse must take especial caution in the care of her hands, and in the avoidance of all risks of contamination.

The most recent important addition to the treatment of syphilis is the combined preparation of arsenic, known as *Salvarsan* or *606*. This may be given by intravenous injection or by injection into the buttocks or muscular tissues, and occasionally by the mouth. Its use is sometimes followed by considerable disturbance, and it is often customary to have the patient remain in bed for a day or two after its administration. It is a powerful germicide, destroying the germ of syphilis, and also that of some of the tropical diseases whose germs are found in the blood. If the nurse is to assist the physician who is using this treatment, she must prepare the skin of the patient at the site of the injection, and if the intravenous method is employed it may be necessary to use anesthesia as well. This drug is so powerful that it should never

be used except by physicians and those competent to employ it.

Although the drug may be used for many parasitic diseases, it is chiefly employed for syphilis. The patient may not know if she has syphilis, and the nurse must be careful not to tell the patient or anyone else the nature and purpose of the remedy which is employed. In the public mind salvarsan is associated with syphilis, and if a patient was receiving this drug for some other parasitic disease, and the fact became known, it would at once be thought that the patient had syphilis.

The nurse should obtain from the doctor precise directions concerning the care of the patient, and also a statement of what effect he expects the remedy to produce. She should note the symptoms which follow its administration accurately, and report them fully to the doctor.

The Results of Syphilis.—While a certain number of cases of syphilis are cured by vigorous treatment, in many recovery never occurs. Disease of the bones or blood-vessels gradually develops, the liver and internal organs are affected, and death ensues not as the direct result of syphilis, but caused by the changes which syphilis brings about.

The Treatment of Hereditary Syphilis.—The treatment and nursing of syphilis in the newborn child have been described in the section upon Obstetrics. Older children may have syphilitic ulceration upon various parts of the body, especially about the mouth and nose, ulcers upon the scalp, or ulcers upon the legs and about the anus and vulva. These cases must be treated as distinctly septic, and every precaution taken to avoid contamination of other parts of the body, and also to

secure the proper absorption and destruction of syphilitic discharges. Tonic treatment, careful feeding, cod-liver oil, and the best possible hygiene are used in these cases.

Precautions for Nurses in Dealing with these Cases.—In addition to the risks of physical contamination, other responsibilities are placed upon the nurse with these patients. With married women who have been infected by their husbands the occurrence of such infection might be made the occasion of divorce. While no one can deny the justness of this, still the knowledge of the patient's malady should not come to her through the nurse. She should remain strictly non-committal upon the nature of the disease, referring the patient and her friends to the physician for information. If this be true regarding a patient, the nurse must be still more silent in giving information to anyone else regarding the patient's disease. Scandal is so easily excited that, if the nurse were to describe the patient's symptoms to others, a suspicion of specific disease and rumors of such a condition might readily be excited. Accordingly the nurse must guard very strongly the secret which has come without any wish of hers into her possession. In justice to others, she must remember that upon leaving such a case she is practically septic, and she must be exceedingly thorough and careful in disinfection before taking an obstetric or surgical case.

APPENDIX.

DIETARY.

Albumin or White-of-egg Water.—Stir whites of two eggs into one-half pint of ice water without beating. Add enough salt or sugar to make palatable.

Barley-water, Gruel or Jelly.—Wash two ounces of pearl barley with cold water. Boil five minutes in fresh water; throw both waters away. Pour on two quarts of boiling water; boil down to a quart. Strain (if patient desires) and flavor with thinly cut lemon rind. Add sugar to taste.

To make jelly, put two tablespoonfuls of washed pearl barley into a saucepan with one and one-half pints of water. Boil slowly down to a pint. Strain and allow liquid to set into a jelly.

Beef-juice.—Cut a thin juicy steak into pieces one and one-half inches square, and brown separately one and one-half minutes in a frying pan. Squeeze in a hot meat-squeezer or lemon-squeezer, and flavor with salt and pepper. May serve hot or cold.

Beef Sandwich (Scraped).—Scrape pulp from a good steak, season to taste, and spread thinly on thin slices of buttered (slightly) bread.

Beef-tea.—One pound of steak from top of round; one pint of cold water; salt. Wipe steak, remove all fat, and cut in small pieces. Soak three hours in the cold water; then place on back of range for one hour, care

being taken that the heat is not sufficient to coagulate the juices. Strain, season, and re heat; same care as regards juices in heating as before.

Chicken-broth.—Dress and clean a chicken. Remove skin and fat, disjoint, and wipe with a wet cloth. Put into kettle with one and one-half quarts of cold water; heat to boiling-point, skim, and cook slowly until meat is tender. When half done add one and one-half teaspoonfuls of salt and a few grains of pepper. Cool thoroughly and skim fat. Re-heat and serve.

Clam-broth.—Wash thoroughly six large clams in shell; put in kettle with one cup of water; bring to boil and keep there one minute; the shells open, the water takes up the proper quantity of juice, and the broth is ready to pour off and serve hot.

Mutton-broth.—Add one pound of loin of mutton to three pints of cold water; boil slowly until very tender, adding one teaspoonful of salt when half done. Strain, and when cold skim off fat. Three tablespoonfuls of rice or the same amount of barley added makes it more palatable. The following formula for mutton-broth has been found especially useful: Three pounds of loin of mutton are placed in three quarts of water. The meat is slowly boiled until it becomes very tender, adding a little salt. To this add one pint of stewed or canned tomatoes, and one cup of rice. Boil for half an hour, strain through a very fine sieve, remove the fat by skimming, and serve hot.

Oyster-broth.—To one dozen oysters with liquor add one cup of cold water. Let it come to a boil and boil for five minutes. Strain and season.

Veal-broth.—Mince one-half to one pound of lean veal; pour over it a pint of cold water. Let it stand for three hours; then slowly heat to boiling-point. After

boiling briskly for two minutes strain through a fine sieve and season with salt.

Buttermilk.—Buttermilk should be prepared from good, pure cream by churning process. After the butter is formed the milk should be strained and kept well covered in a cool place.

An especially good quality of buttermilk is prepared by selecting the purest and best unskimmed milk and adding to it the bacteria which produce the lactic acid fermentation. These are usually obtained in tablets sold by reliable druggists. Directions for use accompany these tablets. Usually twenty-four hours is necessary for the preparation of the buttermilk, and the degree of acidity can often be regulated by the length of time employed in this preparation. If a thoroughly reliable germ be obtained the buttermilk is not disagreeable to the taste, and is exceedingly nutritious and easily digested.

Should failure occur in this preparation, the nurse must suspect that the tablets are not good or that the milk was not perfectly pure and fresh. In some cases of intestinal disease the physician may direct that the milk be first pasteurized by heating it to 156° F. for six minutes before the buttermilk is made. This pasteurization destroys other bacteria and makes the milk sterile.

Kefir.—Other ferments beside lactic acid are sometimes used in preparing milk, and kefir is one of them. It can be obtained from reliable druggists, with directions for its use. As with buttermilk, the success of kefir milk depends upon the quality of the milk used and the exact following of the directions. Kefir is less often employed than buttermilk and is less available.

Corn Gruel.—Two tablespoonfuls of Indian meal; one tablespoonful of flour; one-half teaspoonful of salt; three cups of boiling water. Mix the meal, flour, and salt. Add enough cold water to make a thin paste. Add to boiling water and boil gently one hour. Dilute with milk or cream.

A richer gruel may be made by using milk instead of water, and cooking three hours in double boiler.

Egg and Lemon.—Beat one egg with one tablespoonful of sugar until very light. Add three tablespoonfuls of cold water, and juice of small lemon. Fill glass with pounded ice and drink through a straw.

Egg and Milk.—Beat milk with salt to taste. Beat white of egg until stiff, and add egg and milk and stir.

Egg-nog with Stimulant.—Make mixture same as for plain egg-nog, and pour it over one tablespoonful of wine or brandy diluted with same quantity. Shake well and serve at once.

Egg-nog without Stimulant.—Beat an egg slightly and add one teaspoonful of sugar and a few grains of salt. To this add one glass of milk. Mix thoroughly and strain. A slight grating of nutmeg if desired.

Enemata (Nutrient) Containing Milk.—Peptonize the milk by the warm process, then add whatever other ingredients the physician may order.

Flaxseed Tea.—Remove black specks from two tablespoonfuls of whole flaxseed. Add to it one heaping tablespoonful of white sugar and a little lemon-juice. Pour on these materials two pints of boiling water. Let stand in hot place four hours. Strain and serve either hot or cold.

Hominy Jelly.—One-half cup of fine hominy added

to one quart of boiling water and one-half teaspoonful of salt. Cook in double boiler down to one pint. Time, three hours usually.

Junket.—One cup of milk, one tablespoonful of sugar, one tablespoonful of sherry wine, one teaspoonful of liquid rennet. Heat milk until lukewarm; add sugar and wine; when sugar is dissolved add rennet. Turn into a small mould and let stand in cool place until firm. Serve with sugar and cream. For flavoring, cinnamon or nutmeg may be used in place of wine.

Koumiss.—One quart of milk; one and one-half tablespoonfuls of sugar; one-third yeast cake dissolved in one tablespoonful of lukewarm water. Take ordinary beer bottle with shifting cork. Heat milk until lukewarm; add sugar and dissolved yeast cake. Fill bottles within one and one-half inches of top; cork and invert. Let stand for six hours at a temperature of 80° F. Place on ice and use after twelve hours. Much waste can be saved by preparing the bottles with ordinary corks wired in position and drawing off the koumiss with a champagne tap.

Milk, Peptonized.—*Cold Process.*—In a *clean* quart bottle put one peptonizing powder (extract of pancreas, five grains; sodium bicarbonate fifteen grains) or the contents of one peptonizing tube (Fairchild). Add one teacup of cold water, shake; add one pint of fresh cold milk and shake mixture again. Pack bottle in ice and use when required without subjecting to heat.

Warm Process.—Mix peptonizing powder with water and milk as described above; place bottle in water so hot that the entire hand can be held in it for a minute without discomfort. Keep bottle there ten minutes; then pack in ice.

Milk Punch.—One cup of milk; one teaspoonful of sugar; one tablespoonful of brandy; a few grains of salt. Dilute brandy with water (one tablespoonful), add sugar and salt, then milk. Shake thoroughly. Serve at once.

Oatmeal-water, Gruel, or Jelly.—One cup of fine oatmeal; two quarts of water (which has been boiled and cooled). Add oatmeal to water and keep in a warm place (at a temperature of 80° F.) one and one-half hours. Strain and cool.

Gruel.—One-half cup of coarse oatmeal; three cups of boiling water; one teaspoonful of salt. Add oatmeal and salt to boiling water and cook in double boiler three hours. Force through a strainer and dilute with milk or cream. Reheat and season.

Rice-water, Gruel, or Jelly.—Pick over and wash two tablespoonfuls of rice. Add to it two cups of cold water and boil until rice is soft. Strain and add milk or cream if desired. Reheat and season with salt.

Prepare gruel or jelly as pearl barley.

Toast-water.—Equal measures of stale bread toasted and boiling water. Cut bread in inch slices, put in pan, and dry thoroughly in a slow oven until crisp and brown. Break in pieces, add water, and let stand one hour. Strain through cheesecloth and season. Serve hot or cold.

Wheat-water, Gruel, or Jelly.—Using the entire wheat, prepare the same as barley-water.

Gruel.—One tablespoonful of flour; two cups of milk; pinch of salt. Mix flour with one-fourth cup of milk. Scald remaining milk in double boiler, add flour paste, and cook thirty minutes. Season.

PREPARATION OF SURGICAL SUPPLIES.

Sterilization.—*By Dry Heat.*—Instruments, dressings, and appliances may be made sterile by dry heat. Thorough baking has long been known to be an efficient method of bringing about this result. In the absence of appliances for boiling or steaming, this may be resorted to in private houses as a means of sterilization. It is difficult to estimate the precise temperature employed, as a thermometer can scarcely be used with a range or cook stove. This method cannot be a very accurate one, and is inferior to boiling or steaming. If baking is employed, at least one-half hour should be devoted to this method of sterilization. The material to be sterilized should be placed in a perfectly clean pan and put into an oven. It is well to leave the door of the oven slightly ajar, that the smell of burning may be quickly detected.

Boiling is a method of sterilization well adapted to the preparation of instruments. At 212° F. germs may be destroyed without injury to the object sterilized. Metal objects are best boiled in a 1 per cent. solution of sodium carbonate, which prevents rust. Rubber appliances cannot be boiled without softening hard rubber and destroying its shape. Soft-rubber articles can be boiled, but no alkaline substance should be added to the water. To be thorough, sterilization by boiling should occupy one-half hour. Should this be impossible, at least ten minutes must be devoted to the boiling of instruments.

Steaming.—Sterilization by steam is preferred for the preparation of gauze, sheets, towels, blankets, gowns, caps, and all fabrics. The penetrating power of steam enables us to sterilize thoroughly the meshes and threads of cloth, which cannot be done so well in any other way.

Steam sterilizers vary greatly in complexity, size, and cost. The best are those which bring steam to bear under pressure, thus forcing the heated vapor through the articles to be sterilized. It is possible by this means to place an object in a glass tube, plugging the tube with cotton, and placing the tube in a steam sterilizer, to have the steam forced through the cotton and thus sterilize the contents of the tube.

By Formaldehyd.—The vapor of formaldehyd is an efficient sterilizing medium. Its cost and irritating prop-

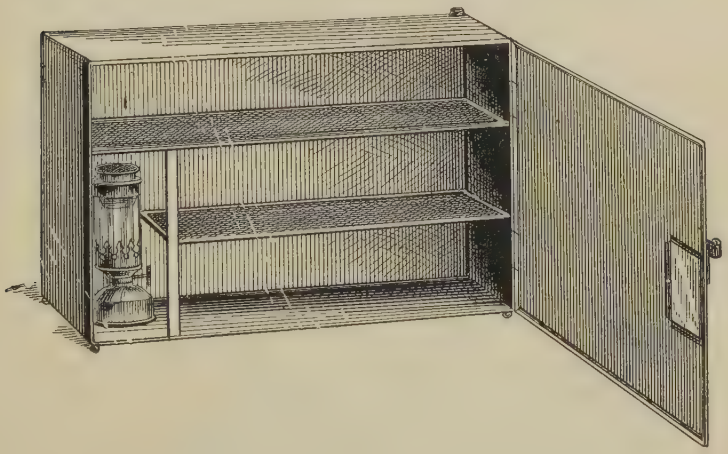


FIG. 91.—Apparatus for use in sterilization by means of formaldehyd.

erties make it less available than steam under pressure. Instruments may be sterilized by formaldehyd by placing them in a suitable chest or box in which the vapor is formed and from which the air is carefully excluded. The accompanying illustration shows Reik's sterilizer (Fig. 91) for the use of formaldehyd. Fifteen minutes' time is necessary for such sterilization. Tablets of for-

maldehyd are heated by an alcohol lamp, thus liberating the antiseptic vapor.

The Preparation of Dressings.—Operators in hospitals differ considerably in the preparation of surgical dressings. This arises from various views regarding the efficiency of different methods, and also from the fact that there is a wide difference in the sorts of sterilizers and apparatus possessed by various hospitals. The writer gives methods which have proved satisfactory, and adds to them those employed in several reliable hospitals where a number of operators are constantly at work.

Cheesecloth Gauze.—A very efficient dressing is made from a cheap quality of cheesecloth. This should first be boiled in a 1 per cent. solution of sodium carbonate or bicarbonate until the material placed in the cloth by the makers to facilitate its folding and packing has been thoroughly removed. The cheesecloth should be carefully rinsed and dried, and may then be cut into convenient sizes. If it is desired to make a sterile dressing only, pieces of this cloth should be sterilized by steam three times, for one-half hour at each time. If it is desired to make the cheesecloth antiseptic, it should be soaked in mercuric chlorid solution (1 : 1000), to which salt is added to prevent decomposition of the bichlorid. It may then be kept in sterile jars tightly closed. If gauze be purchased, it is well to cut it into convenient lengths and to resterilize it, keeping always on hand a supply sufficient for any emergency, and resterilizing frequently so that the gauze may be thoroughly reliable.

Bichlorid Gauze.—Cut gauze in one-yard pieces; boil for twenty minutes. Soak in 1 : 2000 bichlorid for twenty-four hours. Wring out, fold in sterilized sheets, and dry.

Take off outside sheet and sterilize gauze for one hour. Fold in four-inch wide pieces, roll, and keep in sterile jar.

Iodoform Gauze.—In hospitals iodoform gauze is prepared by the nursing staff and kept constantly on hand. In practice conducted in private houses it is convenient to employ iodoform gauze furnished by reliable manufacturers, and put in small, tightly sealed glass jars. Such jars must not be opened until the gauze is needed; and if the entire contents of a jar are not used, the remainder should be thrown away or very carefully sterilized by steam or boiling before it is again employed.

Preparation of Iodoform Gauze.—Cut five pounds of gauze in two-yard pieces, boil for twenty minutes, wring out, and soak in bichlorid 1 : 2000 for twenty-four hours. Wring out in sterile pan. Make an emulsion of one-half pound of iodoform that has been sterilized and 1½ pints of sterile glycerin. Add this as needed to 1½ pints of alcohol. Dip the gauze in the alcohol to which the emulsion has been added, wring out, and rub gauze until the color is even. Fold in four-inch wide pieces and roll. Place in sterilized covered jar and keep in dark closet.

Washing and Re-sterilization of Gauze and Bandages.—The expense of gauze is so great that experiments have been made to determine whether the outer layers of dressings which do not become stained with discharges, might not safely be washed and re-sterilized for further use. This has been found feasible, and the following method is that employed at the Pennsylvania Hospital:

All gauze and bandages from all dressings are collected in paper bags and taken to the laundry. There they are transferred to netted cord bags, which are only half filled.

These are put to soak over night in cold water, which is changed several times. The following day they are placed in an iron washer capable of resisting steam pressure up to ten pounds. They are then washed in cold water until it runs perfectly clear. The gauze, still in these bags, is then washed with warm water, soap, and sal soda, and rinsed in hot water. After the rinsing, enough hot water is turned into the washer to cover the bags of gauze. Steam is then turned on to a pressure of ten pounds, the thermometer showing a temperature of 236° F. This temperature is maintained for one-half hour. During all this process the washer is moving with a to-and-fro motion, which continually agitates the gauze, and presents all parts of it to the action of the water and steam. The bags containing the gauze are then put in the extractor, and are then returned to the hospital, where they are overhauled under the direction of the Supervisor of Nurses. The gauze is untangled, straightened, cut, placed in packages, and sterilized. The final sterilization is done at a temperature of 250° F., with a pressure of fifteen pounds.

If gauze is to be washed, the best quality must be selected. A separate plant is required, costing several hundred dollars, but this is more than saved from the amount spent for new gauze. In the operating-rooms new gauze only is employed. Repeated tests show that the old gauze, treated by this method, is absolutely sterile.

Cotton.—Cotton must be sterilized by baking, and its inflammable character must be remembered and caution taken to avoid burning. The difficulty of sterilizing cotton has limited its use to filling dressing composed largely of gauze. The gauze thus comes next to the skin of the patient, as it may be made thoroughly antiseptic.

Sheets, Towels, Blankets, Caps, and Gowns.—Such material is best sterilized by steaming under pressure, and this should be done when possible in a separate sterilizer from that employed for the preparation of ligatures or dressings. It is best to employ such a sterilizer that after steam has been used sufficiently long it may be turned off, and hot air forced through the fabrics, drying them thoroughly. They may then be folded or rolled carefully with sterile hands, and pinned up in bundles in sterile linen and labelled.

Bandages.—Bandage material which is thoroughly clean is considered satisfactory by most operators. If, however, sterile bandages are desired, they may be made of gauze rolled upon a small stick to give firmness, sterilized, and wrapped in sterile materials in small bundles. The many-tailed flannel bandages used after abdominal section do not require to be sterilized, as they do not come in contact with the immediate vicinity of the wound.

Preparation of Adhesive Strips.—These are of two kinds, those which pass entirely across the surface of the abdomen, and those to which tapes are attacked, which are tied over the dressing. The first may be cut at the time when the dressing is made, as the plaster will keep moist better in the roll than after the strips are cut; or the strips may be cut previously and kept in a jar or air-tight tin can. If tapes are used, the length of the adhesive portion of the band should not be less than six inches, and the tapes should be sewed to the adhesive plaster firmly.

Preparation and Care of Instruments.—Instruments may be prepared for operation by boiling them for twenty minutes in 1 per cent. solution of sodium carbonate. This is conveniently done in covered trays, which need

not be opened until just at the beginning of the operation. The use of the soda prevents rusting, and cleanses the instruments by dissolving any albuminoid material which may adhere to them. Some operators prefer to have instruments boiled and then placed, after rinsing in a solution of carbolic acid (1 per cent.) or in sterile water. We have had the best results by boiling instruments in lysol solution (one per cent.). This prevents rust, is antiseptic, and does not injure the plating. We have had good results from the use of covered trays, which require no further manipulation of the instruments. If the operation has been upon a septic case, the instruments should be immediately sterilized after its completion. They should be boiled at least one-half hour after such a case. If the case has been aseptic, the instruments should be washed with hot soap and water, and brushed with a nail brush or jewelers' brush, especial attention being paid to joints, locks, and corrugated surfaces, the instruments being taken apart for such cleansing. The instruments may then be dried, and the joints lubricated with sterile glycerin or sterile olive oil. They should be placed upon a glass shelf in an air-tight cabinet or case. Instruments may be scoured with any simple cleansing powder, and should be promptly replated if the plating breaks and rust begins to appear. It should be the duty of the nurse or assistant in charge of instruments to see that they are kept sharp and in proper condition.

Needles.—Damaged needles should be at once destroyed. To keep them from rusting, needles may be kept in alcohol or in glycerin. Some prefer to stick them into a mass of carded wool kept in a small case with a screw top. This prevents rusting and is a convenient method for retaining them.

Sutures.—Silkworm-gut is most readily sterilized, and is the most reliable suture material in use. It may be prepared by boiling, by soaking in mercuric-chlorid solution 1 : 1000), or by boiling in a glass tube containing alcohol, after which the tube is closed with a tight cork. Silkworm-gut is sometimes purposely softened and made antiseptic by boiling it in creolin or lysol. A simple and convenient method of preparing it is to boil it with the instruments. Care should be taken to select the best gut; and it may be purchased in quantities from dealers in fishermen's supplies, and the best and longest strands chosen.

Silk.—The best quality only of silk must be selected. Fine, medium, and large silk are the sizes used. What is known as "pedicle silk" is most employed for ligating important vessels in the pelvis and the pedicles of tumors. Silk should be wound upon glass reels, and may be prepared for operation by boiling for one-half hour several times. It may be sterilized by steam, by wrapping the reels in gauze, stitching the bundle together, and not opening the gauze until the time of operation. Although silk is weakened by long-continued and repeated boiling, still the best silk is uninjured by several sterilizings. Fine silk should not be repeatedly boiled. The nurse should endeavor to estimate how much will be required for an operation, and this should be freshly prepared just before the operation. It may be kept in glass tubes plugged with cotton, in which it has been sterilized, or in alcohol.

Catgut.—Numerous methods for the preparation of catgut are followed by various hospitals and operators. For work in private houses, catgut put up in hermetically sealed tubes by reliable makers is very convenient and

has proved reliable. The tube is placed in the sterilizer with the instruments and silkworm-gut, and is again sterilized by boiling. At the time of operation the tube is grasped in the hands wrapped in a towel, and is broken at a mark filed upon the glass. The catgut wound upon a glass rod or reel is then dipped in sterile water if the gut is too stiff for the convenience of the operator, when it will usually be found ready for use. Catgut must be kept in alcohol or bichlorid solution or in carefully closed receptacles.

Marine Sponges.—Marine sponges are difficult to prepare, and have been largely replaced by gauze pads and sponges. The following method is that given by Kelly: 1. Lay them in a stout cloth and pound sufficiently to break up grit and lime. 2. Rinse with warm water ten or more times until it remains clear. 3. Immerse in a muriatic-acid solution (two drams to one pint) for twenty-four hours. 4. Immerse in saturated warm potassium-permanganate solution. 5. Decolorize in a hot oxalic-acid solution. 6. Pass through lime-water to take out all the oxalic acid. 7. Rinse thoroughly in plain sterile water. 8. Immerse in a 1 : 1000 solution of mercuric chlorid for twenty-four hours. 9. Preserve until used in a 3 per cent. carbolic-acid solution. The hands manipulating the sponges during these preparations from step 4 on must be sterile, and much manipulation may be done with instruments. When wanted for use the sponges are lifted out with long sterilized forceps and rinsed in sterilized water.

The following method is given by the *American Textbook of Surgery*,[1] page 1170: Marine sponges should be first placed in a bag and beaten for a long time in order to free them from the sand in their meshes. They should

[1] Fourth edition.

then be washed for some days in water which is frequently changed, and best in water which is slightly acidulated with hydrochloric acid. They must again be washed in pure water in order to remove the acid. Different methods may be followed in their disinfection: 1. They may be soaked for twenty-four hours or less in a solution of ordinary washing soda, a pound of the soda to a dozen sponges, and the soda then be removed by washing in clean water. The sponges are next soaked for twenty-four hours in a 1 : 20 carbolic-acid solution, and dried by moderate artificial heat. They are then well wrapped up and kept in a dry place. 2. After beating the sponges free from sand and washing them in the warm water they should be soaked in a solution of potassium permanganate (half an ounce to the gallon), and if the pink color of the solution is lost more permanganate should be added. If this addition is necessary, the sponges should be taken out of the liquid, the permanganate dissolved, and the sponges put back, for if the permanganate is put in upon the sponges it discolors them in spots. They are then washed in warm water and dipped for a very few minutes in a solution of sodium sulphite (ten drams) and hydrochloric acid (two ounces to the gallon of water). If they are allowed to remain any length of time in this solution, they will not only become bleached, but very much softened. They are then thoroughly washed for twenty-four hours, after which they are kept in glass jars in a carbolic solution (1 : 40). 3. Borham's method is that adopted by Greig Smith in preference to others. The sponges after being cleansed are first soaked in a 1 per cent. solution of potassium permanganate (about seventy-five grains to the pint). The sponges, having next been washed repeatedly in

boiled water, are placed in a gallon of water in which has been dissolved half a pound of sodium hyposulphite for a dozen sponges. Four ounces of oxalic acid are added, which bleaches the sponges and dissolves out any fibrin in their meshes. They should remain in this solution not more than ten minutes, and are finally placed in a carbolic solution.

Gloves.—Rubber gloves may be sterilized by boiling or by steam, and placed in a bichlorid solution until they are used. Some operators prefer to have them dry when placed upon the hands, while others fill them with bichlorid or lysol solution, allowing the antiseptic fluid to escape gradually as the hands are inserted, while others use sterile glycerin as a lubricant. Grease should not be used upon rubber gloves. They should be completely turned and thoroughly dried after use, and sterile gauze should be packed into the fingers and palm to keep the surfaces from adhering.

Disinfection of the Body.—To cleanse thoroughly the body of an operator or nurse, the Turkish bath is the most available procedure. This may be followed by a bath in dilute antiseptic solution; but usually the Turkish bath is sufficient. The hair should be thoroughly washed and shampooed, and carefully dried. Absolutely clean clothing must always be worn. The attention of nurses as well as physicians must be called to the fact that those persons who have purulent or mucopurulent discharges from the body cannot be considered aseptic, and should not take part in surgical work.

Fumigation.—The most efficient and convenient method of fumigation and disinfection which has come under our observation is that by formaldehyd. The following method has given us excellent results, as proved by bacteriologic examination, at the Jefferson Maternity.

Formaldehyd lamps as devised and furnished by Schering and Glatz have been employed. The larger size has been employed for rooms, and the smaller for closets, incubators, and cases. These lamps consist essentially of an open cup, beneath which is an alcohol lamp. By the heat of the lamp the vapor of formaldehyd is liberated, and accomplishes its purpose by penetrating all portions of the room.

The room which is to be fumigated should have doors and windows thoroughly calked with cotton or oakum,

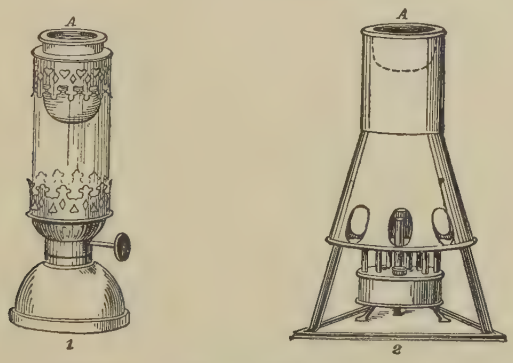


FIG. 92.—Apparatus for generating formaldehyd from tablets of polymerized formaldehyd: 1, small form; 2, for larger quantities; *A* in each figure indicates the cup in which the tablets are placed.

and paper pasted over the edges of cracks around the doors and windows. Cupboards or closets communicating with the room must be widely opened; furniture and bedding may be arranged conveniently within the room. A large pan is placed upon the floor, and in this several inches of water. Two bricks are placed in the center of the pan, and on these the formaldehyd lamp. The lamp is prepared for use by filling the cup with pastiles of formaldehyd, using as many as the cup will hold. The

alcohol lamp is filled, and the wick trimmed. The pastiles are then moistened with alcohol and the alcohol lamp is lighted. The door is then closed and the room allowed to remain unopened for twenty-four hours if possible. Should this not be possible, twelve hours at least must elapse.

When the room is opened it must be thoroughly aired, as the fumes are very irritating. The paint in the room should then be scrubbed, the floor and furniture scrubbed, and the walls and ceiling thoroughly wiped. The room should remain open to the air for twenty-four hours if possible. Fumigation is often done by fumigating cylinders or small stoves which are placed in a room and lighted, the room being then tightly closed. Formaldehyd vapor is most efficient, but so irritating to the throat and nose that it must be used with great caution. Accordingly, the room must be very tightly sealed by pasting paper over the cracks and about the doors and windows. Pastiles of formaldehyd are very convenient for use in fumigation.

Preparation of Iodoform Gauze in Considerable Quantities.—Ten pounds by weight of gauze are soaked in a solution of mercuric chlorid (1 : 1000) for twenty-four hours. Iodoform (one pound), glycerin (one pint), and alcohol (one pint) are mixed, twenty-two and a half grains of mercuric chlorid having been dissolved in the alcohol. This is three tablets, each seven and a half grains. This iodoform mixture should stand several days before using. The gauze is then wrung out of the bichlorid solution, cut in two-yard lengths, and put through the iodoform emulsion. If this emulsion is not a perfect one, add glycerin or alcohol to dissolve thor-

oughly the different ingredients. The gauze is rolled, and is not exposed to light.

Iodized Catgut.—The following method of preparing catgut with iodin is in use in the Jefferson Medical College Hospital:

Strands of catgut are cut in 48-inch lengths and wound loosely on two fingers. The strand is fastened by twisting the end, and care is taken to avoid knots. The catgut is then placed in coils in glass beakers, which are put in the sterilizing oven, the temperature of which is brought to 100° C. during fifteen minutes. The temperature of the sterilizing oven is kept at 100° C. continuously for fifteen minutes.

Liquid albolene is then poured on the catgut in a sufficient quantity to completely cover it. The temperature of the sterilizer is then raised to 140° C., and maintained at that point for fifteen minutes, when the heat is turned off and the catgut allowed gradually to cool. It remains in the liquid albolene for twelve hours, when it is again heated to 140° C., raising the temperature to this point gradually through fifteen minutes, and maintaining this temperature continuously for fifteen minutes.

It is then allowed to cool for three hours, after which it is removed from the albolene and placed in sterile bottles. Over the catgut is then poured a solution of alcohol (95 per cent.) and iodin ($\frac{1}{4}$ of 1 per cent.), in which the catgut is kept until it is used.

Should the solution lose color by the fading of the iodin, the iodin portion of the solution is renewed.[1]

Chromicized Catgut.—Catgut may be prepared

[1] The writer is indebted to Miss Eleanor Smith, Chief Clinic Nurse of the Jefferson Hospital, for this account of the preparation of iodized catgut.

advantageously as follows: Carefully selected gut is soaked in Squibb's ether for twenty-four to forty-eight hours. The ether is then poured off, and a solution composed of mercuric chlorid (forty grains), tartaric acid (two hundred grains), and alcohol (twelve ounces), is then poured upon the catgut. The gut is allowed to remain in this solution for ten minutes to a half hour, according to the size and strength of the catgut. Medium sizes are left from twenty to twenty-five minutes. This bichlorid and alcohol solution is then poured off, and the gut is washed well in alcohol. It is then immersed in potassium bichromate (five grains), water (one-half pint), and alcohol (95 per cent.) (one-half pint). This solution must be carefully prepared, for if a precipitate forms the solution is useless. The catgut is left in this twenty-four hours, when the solution is poured off and the gut again thoroughly washed with alcohol. It is then placed for keeping in the following solution: Alcohol (95 per cent.) (one pint); solution of palladium chlorid (fifteen grains to one ounce) (two drops). Be careful never to touch the catgut in changing the solution or in washing. Catgut not chromicized is prepared in the same manner with the omission of the use of the solution containing potassium bichromate. Tablets of mercuric chlorid and ammonium chlorid must not be used in preparing catgut, as the ammonium chlorid affects the gut.

Cumol Catgut.—Catgut is also prepared, by Krönig's method, by using cumol. (Kelly's *Operative Gynecology*.)

1. Cut the catgut into the desired lengths and wind twelve strands into a figure-of-eight form, so that it may be slipped into a large test-tube.

2. Bring the catgut gradually up to a temperature of 80° C., and hold it at this point one hour.

3. Place the catgut in cumol, which must not be above a temperature of 100° C.; raise it to 165° C. and hold it as this point for one hour.

4. Pour off the cumol and either allow the heat of the sand-bath to dry the catgut, or transfer it to a hot-air oven, at a temperature of 100° C., for two hours.

5. Transfer the rings with sterile forceps to test-tubes, previously sterilized as in the laboratory.

In making the catgut up into skeins it is only necessary to tie the ends in the isthmus of the figure of eight to hold them securely in proper shape. If convenient, it is better to use the hot-air oven for the drying process; but this is not absolutely essential, as a sand-bath can be improvised, as suggested by Krönig, to serve this purpose. A beaker glass of at least a half liter capacity is embedded three-fourths of its height in a tin or agate-ware vessel of sufficient capacity to permit three-fourths of an inch of sand to be packed about the sides and beneath the glass.

In drying or boiling, the catgut should not come in contact with the bottom or sides of the vessel, but should be suspended on slender wire supports or placed upon cotton loosely packed in the bottom. During the drying process the beaker glass is covered with a sheet of pasteboard, through which a centigrade thermometer is thrust, so that the mercury bulb may be suspended about midway in the vessel. In this way the temperature can be regulated perfectly. A Bunsen burner is placed under the sand-bath, and the temperature in the beaker glass is slowly brought up to 80° C., where it is held for one hour to dry the catgut. A higher temperature than 100° C., before the catgut is thoroughly dry, renders it brittle; this step in the method must be carried out most

carefully. When the drying process is completed the cumol is poured into the beaker glass and brought up to a temperature of 165° C., a little short of the boiling-point, with two Bunsen burners. A copper-wire netting should be placed over the beaker glass to prevent the ignition of the cumol. This temperature is more than sufficient to kill all micro-organisms, and it is not necessary to allow the cumol to boil, which causes unnecessary evaporation. The catgut is left for one hour at this temperature, when the cumol is poured off for subsequent use.

Cumol, which is of a clear, limpid, or slightly yellowish appearance when procured from the chemist, is changed to a brownish color by boiling.

The catgut is allowed to remain in the sand-bath until the excess of cumol is driven off and it appears entirely free from any oily matter. A period of one to two hours is usually sufficient to dry it thoroughly.

From the sand-bath or hot-air oven it is transferred with sterile forceps to sterile test-tubes, such as are used for culture-media, in which it is preserved from contamination until ready for use. Small quantities should be placed in each tube, to obviate the necessity of opening them too frequently.

In conclusion, it is well to bear in mind that while cumol is not explosive it is very inflammable, and great care should be observed in lifting the wire screen from the beaker glass to prevent drops of the cumol from falling into the flame or on the heated piece of metal on which the sand-bath rests, as it will take fire, flare up, and ignite the fluid in the beaker glass. Such an accident has occurred three times in our experience.

OTHER METHODS FOR THE PREPARATION OF SURGICAL SUPPLIES AND ASEPTIC PRECAUTIONS.

Preparation of Catgut.—The following methods of preparing catgut have been found reliable:

Place catgut in ether for forty-eight hours, then boil in alcohol for twenty minutes each day for three successive days. Heavy gut requires one-half hour. It is then ready for use.

Place catgut in ether for five hours; then in oil of juniper berry for twenty-four hours. Boil ten minutes each day in alcohol for three successive days. Keep in alcohol.

Place catgut in formalin (2 per cent.) for twenty-four hours; then place in 95 per cent. alcohol. Dried and prepared each time it is needed.

Place catgut for four hours each day for three successive days in benzin. Then boil in 95 per cent. alcohol twenty minutes each day for three successive days.

Place catgut in benzin for twelve hours; then in oil of juniper berry for twelve hours. Boil this for two hours, using an Arnold sterilizer.

Place the gut in benzin for fourteen hours. Then wash in sterile water and dry. Now place in formaldehyd (5 per cent.) fourteen hours. Wash in sterile water and dry for four hours on frame. Wind on spools and place in 5 per cent. glycerin in absolute alcohol. (In small quantities, take one part of glycerin to 19 parts of absolute alcohol.) The spools are placed in air-tight tubes (metallic) and sterilized for forty-five minutes at 240° F.

To chromicize catgut:

Ten per cent. carbolic acid,	2 fl. oz.;
Chromic acid,	1 fl. dr.;
Catgut,	1½ dr.

Allow this to stand for twenty-four hours; then put in alcohol for keeping.

In getting the correct weight of gut, the following has been tested and weighed by a druggist:

Catgut, size A, 48 strands 24 inches long equals 1½ dr.
Catgut, size B, 45 strands 24 inches long equals 1½ dr.
Catgut, size C, 42 strands 24 inches long equals 1½ dr.
Catgut, size D, 25 strands 24 inches long equals 1½ dr.

Sizes B, C, and D are generally used. A is used for eye-work. It is much better to have all catgut wound on spools, glass preferred. If these are not convenient, roll in rings around the finger and fasten loosely. A small amount of glycerin added to any of these preparations will tend to keep the gut soft, and prevent its curling and becoming brittle, as it does where inferior alcohol is used. The glycerin should be added just before boiling.

Gauze.—*Preparation of Iodoform Gauze.*—Soak four yards of gauze in bichlorid (1 : 500) for twenty-four hours. Wring the gauze from the bichlorid and thoroughly saturate with a mixture of alcohol (2 ounces), glycerin (2 ounces), and pulverized iodoform (8 drams). Rub and slap well into the gauze. Roll or fold, and sterilize for ten minutes in an Arnold sterilizer.

Preparation of Sterile Gauze.—Take four yards of gauze; roll and sterilize in an autoclave thirty minutes each day for three days.

Preparation of Bichlorid Gauze.—Plain gauze immersed in bichlorid solution (1 : 500) for thirty-six hours. Fold, roll, and sterilize in an autoclave for twenty minutes.

Preparation of Gauze Pads for Abdominal Operations.—Gauze pads for abdominal operations should be of sizes from six inches square to twelve inches square. Eight thicknesses of gauze are used in each pad. Turn in the edges of the gauze and hem neatly. Wrap in towels, one dozen in each package, and sterilize in an autoclave. They are again sterilized just before using.

Preparation of Gauze Strips for Packing.—Gauze strips for packing are cut from plain sterile or iodoform gauze. Fold the gauze lengthwise, folding first in half, then doubling a second and a third time. Now turn back the free edge of the gauze, leaving a free edge on either side of the strip. They are cut in strips thirty-six inches long and width of the gauze, being the length of the strip. The width of the strips is from one inch to eight inches. Fold in packages (different widths in separate packages), and sterilize the plain gauze in an autoclave and the iodoform in an Arnold sterilizer.

Incinerating Soiled Material.—There is no satisfactory method of destroying material soiled with septic discharge, except the use of fire. It is often difficult, even in hospitals, to burn a considerable quantity of dressings. These are soaked with septic fluids and do not readily burn, and would clog a furnace in which they might be put. Various sorts of incinerators have been manufactured expressly to dispose of such waste. At the Jefferson Maternity very satisfactory service has been given by an incinerator whose flame is supplied

by gas jets (Fig. 93). Soiled dressings are wrapped in old paper, placed in the wire basket of the incinerator, and the full flame gradually turned on. In a few moments

FIG. 93.—Gas incinerator for destroying soiled dressings.

the dressings are reduced to ashes. It is part of each nurse's duty on different days to be responsible for the incineration of dressings, and the duty is a most responsi-

ble one. The incinerator must be placed where it cannot cause danger from fire. It must be near a large chimney in which the flames and smoke may go. This chimney should be one which is kept constantly warm in winter by receiving heat from the furnace, or some other fire in the cellar. Unless the incinerator stands upon a rock or cement floor, zinc should be placed beneath it, and also should cover the sides of the wall nearest the incinerator.

Preparations of Marine Sponges.—Wash in running water until soft and clean and entirely free from sand. Then place in potassium permanganate (1 : 1000) for ten minutes; then in hydrochloric acid (10 per cent.) for twenty minutes; then put in oxalic acid for fifteen or twenty minutes. Take from the oxalic acid and wash thoroughly in cold sterile water until the acid is removed. Place in carbolic-acid solution (1 : 60) until used.

Preparation of Sterilized Silk.—Usually boiled in alcohol (95 per cent.) for ten minutes when needed. Some doctors prefer silk steam sterilized with dressings for one hour.

Preparation of Silkworm-gut.—Place in bichlorid solution (1 : 1000) for twelve hours; then boil in 95 per cent. alcohol for fifteen minutes, just before using.

Preparation of Normal Salt Solution.—To one pint of sterile water add forty-five grains or three-fourths teaspoonful of sterile salt. Have water warm.

Preparation and Sterilization of Instruments.—All instruments except cutting instruments are boiled in a steam sterilizer for fifteen or twenty minutes. Bistouries or other instruments with sharp edges are wrapped in cotton and boiled for three to five minutes, or placed in a solution of carbolic acid (1 : 20).

Preparation and Sterilization of Dressings.—

All dressings are wrapped in towels, labelled, and sterilized in an autoclave for thirty minutes.

Preparation and Sterilization of Iodoform.—Iodoform powder is placed in a sterile glass jar. A piece of gauze is fastened securely about the top of the jar. The whole is well wrapped in a couple of towels and sterilized for one hour in an Arnold sterilizer.

Preparation and Sterilization of Boric Acid.—Boric-acid powder is prepared and sterilized in the same manner as iodoform powder.

Preparation and Sterilization of Glycerin.—Place the bottle of glycerin wrapped in a towel in an autoclave. Keep there for thirty minutes under ten pounds pressure.

Preparation of Adhesive Strips.—Plain adhesive strips for abdominal dressing. The plaster is torn from the cloth in strips twenty-six inches long and two and one-half inches wide, and laid on a piece of oiled silk, from which they are easily removed when needed. Straps with tapes are made from strips of adhesive plaster six inches long and three inches broad. The ends of the strip are square. Take both corners of one end of the strip and turn them in. This leaves one end pointed and covered with the cloth on the back of the plaster. Sew firmly pieces of white tape to these pointed ends. Place on oiled silk.

Preparation and Sterilization of Jars.—All jars are washed with soap and water and then with bichlorid (1 : 1000), after which they are covered with towels wrung out of bichlorid solution (1 : 1000).

Preparation and Sterilization of Irrigators.—Fountain and glass syringes are boiled in a steam sterilizer for fifteen or twenty minutes, dried and wrapped in

towels until needed, when they are placed in carbolic-acid solution (1 : 40).

Preparation and Sterilization of Tables.—Tables are washed with a solution of bichlorid (1 : 1000) after being cleaned with soap and water.

Preparation and Sterilization of Surgeons' Gowns.—Surgeons' gowns are wrapped in packages, three gowns in each package, and sterilized in an autoclave.

Preparation and Sterilization of Rubber Articles.—Rubber articles, such as aprons, pillow-covers, etc., are washed with carbolic-acid solution (1 : 20).

Preparation and Sterilization of Gloves.—Rubber gloves are thoroughly washed with tincture of green soap and sterile water, rinsed with sterile water, and then placed in bichlorid (1 : 100) for a few minutes. They are then put in boiling water for about a minute. This is done with sterile hands. Take out of water and lay on a sterile towel. When dry, dust with sterile pulverized starch, and pack with sterile gauze, five or six layers cut in the shape of a hand. Powdered starch is again dusted into the glove and on the surgeon's hands before putting them on. Cotton gloves are washed, boiled, dried, then put in packages, and sterilized in an autoclave for thirty minutes.

Preparation and Sterilization of the Hands.—The hands should be kept as smooth as possible; nails short and well manicured. With a sterile nail-brush the hands and arms are thoroughly scrubbed with warm sterile water and green soap for five minutes, then rinsed with sterile water and immersed in bichlorid (1 : 1000) for five minutes, again using sterile brush. They are then scrubbed thoroughly with benzin or alcohol (95 per

cent.), and rinsed with sterile water. In addition to this, some surgeons use potassium permanganate (1 : 16) and oxalic acid (10 per cent.). Immersing the hands in lime-water after this soothes the irritation.

Weir's method for rendering the hands soft and smooth and making them antiseptic is as follows: Take a teaspoonful of sodium carbonate and one of chlorid of lime. Mix in the palm of the hand with water enough to make a cream. Rub the hands and arms well, cleansing the nails with soft sterile wood sticks (orange-wood preferred). Rinse with sterile water.

Rules for Nurses for Maintaining an Aseptic Condition of the Body and Clothing.—Nurses may maintain an aseptic condition of body and clothing by bathing first with green soap and water, hair included; then with bichlorid (1 : 5000). Rinse this off and dry. Clean cotton clothes and fresh cap are donned, and over all is worn a large sterile apron covering the whole dress. No nurse attending obstetric cases should be sent directly to maternity wards from a ward where a septic condition of wounds exists or where infectious maladies exist. When on duty in maternity wards, she should not be allowed to enter any other part of the hospital.

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